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The AUTOMOBILE

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JAN 17 1921

CHAMPION TRADE MARK

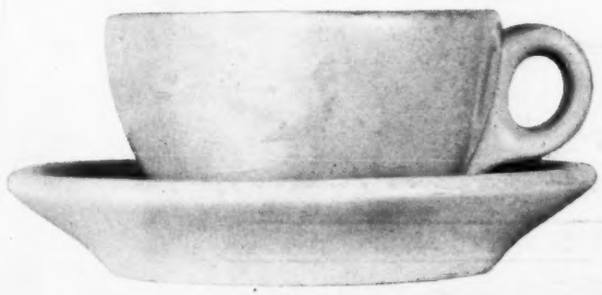
Champion Dependable Spark Plugs

Champion Insulator *versus* Porcelain

The Insulator used in Champion Spark Plugs is no longer known as "porcelain." This is not the proper term because it implies qualities wholly different from those which have been developed in the Champion Insulators.

Champion Spark Plug Company, Toledo, Ohio

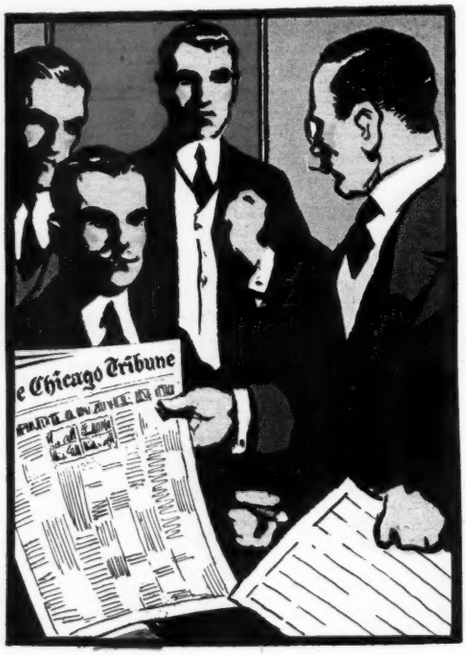
Champion Spark Plug Company, of Canada, Ltd., Windsor, Ontario



The word porcelain implies fragility and low heat resisting properties.

Champion Insulator —Practically unbreakable under wonderful stress electrically. Heat cannot break it.

Entered as second-class matter Jan. 2, 1905, at the post office at New York, N. Y., under the act of March 3, 1879.



MORE and more advertisers are apportioning large blocks of their national appropriations for commanding campaigns in the Chicago Tribune, because:

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2. Prosperity of this market is indicated by the enormous crops and by a decrease in business failures notwithstanding the contrary trend throughout the rest of the country.
3. Overwhelming Circulation—450,000 Daily and 800 000 Sunday—reaching best buying classes in the five states.
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NOW is the time for advertisers to buy results. Make every line of copy sell goods; make every dollar expended build sales. "Prestige," "institutional" and "general" publicity must be subordinated to direct action advertising if 1921 business is to beat 1920 records. Circulation must be bought on a cold-blooded basis of price and quick results. The Chicago Tribune welcomes the test of these strenuous times. It is ready to have every advertiser weigh it in the balance against any other available medium for creating sales.

The Chicago Tribune is more than a newspaper; it is a great sectional medium with unique sales-building powers in a market that constitutes one-fifth of the United States.

The Advertising Managers' Council of the Motor and Accessory Manufacturers' Association recently discussed the question "How Can We Turn Our Prestige Advertising Into Cash." All mediums were considered but the answer was NEWSPAPERS.

The Chicago Tribune

THE WORLD'S GREATEST NEWSPAPER

Tribune Bldg., Chicago. 512 Fifth Ave., New York. Haas Bldg., Los Angeles.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLIV NEW YORK—THURSDAY, JANUARY 13, 1921 No. 2

Novelties Not Abundant at New York Show

Effect of recent depression not yet reflected in passenger car design. Most models shown are similar to those exhibited last year, but brighter colors add attractiveness. Some new chassis and engines have features and refinements which are described here.

ANY results that the motor car depression of the last seven months may eventually have on vehicle design has not yet become apparent in the exhibit of the eighty-nine makes of vehicles at the twenty-first national show of the National Automobile Chamber of Commerce now running for the week in Grand Central Palace. Engineering departments may be working overtime in factories on designs that admit of more economical manufacturing and that will give improved performance due to light weight, better use of fuel, etc., but these are not at the show, excepting in a few instances where changes in manufacturing programs were decided upon a year ago and the new products are not a direct result of the trend of events in the last few months.

As a show it parallels rather closely in character and quality that of a year ago, there being 307 exhibitors a year ago and the same number this week. It is not the biggest show in history as 1913 recorded 424 exhibitors. It was not to be expected that many new designs would be on hand as the unsatisfied demand that continued up to last June was not conducive to the production of new designs.

The show carries external evidences of many concerns adding merchandising features not so prominent in former years, particularly with models that are not in greatest demand. On touring cars and roadsters the show contains more specially painted jobs. Glass wings on windshields are added merchandising talks. On most of the fifty-six cars fitted with disk wheels the equipment is a sales argument rather than an indication of stock equipment. Disk wheels have not yet reached this status in stock equipment.

On the other hand the exhibit of but thirty-eight polished chassis falls behind the record of former years, yet the attention that these constantly receive must be accepted as an indication of the interest if not the sales value of such an exhibit. Relatively new chassis, such as LaFayette, Lincoln and Pierce-Arrow are magnetic centers. The sales value of a good chassis cannot be overlooked and it might be injected as a show criticism that manufacturers could to advantage continue the chassis exhibit and add to the merchandising value of the show space. The show should be used as one factor in bringing about the disintegration of a buyers' strike. Every merchandising feature needs to be used to the maximum. The Marmon exhibit of miniatures made to one-quarter size is one example of a good merchandising thought.

As indicating a trend of design the fact that the number of four-cylinder cars has been increased by fifteen, and six-cylinders reduced by ten, suggests the increasing utility aspect of the industry. There are no so-called engineering avalanches at the show, no

influx of fours, sixes, eights or twelves. There is no trend toward a greater use of multi-cylinder jobs, rather a stationary situation excepting for a slight movement toward fours. The question of cylinders is more an engineering one rather than a merchandising one. The time when a maker changed from a four to a six, or from a six to an eight to get into a certain market has little echo in the present show.

The criticism that reached America from the recent Olympia show in London to the effect that our touring cars were sorely criticized both from style and comfort viewpoints might be taken to heart to advantage. Too many cooks spoil the broth, and frequently factory heads quite ignorant of the fundamentals of body design have a major say in it. The fact that the body design does not make a good engine worse or a poor engine better permits of someone dictating a design who would not dare to interfere in the design of an engine, or transmission system. Fools step in where angels fear to tread. It is not surprising that there are body designs that are not a credit to the manufacturer. There is indication of a trend away from the present straight edge body style to the rounded edge. The straight edge job calls for more art in handling than the rounded edge. It is easier to work with curves than straight lines. The return to the curved lines is being forced on body engineers because the straight edge job has been so poorly done in too many cases. A good body engineer can accomplish a most satisfactory result with either, but the amateur cannot.

There can be no doubt but that the demands of production in the last five years carried a penalty of sombre colors. The present buyers' market is bringing out the nickeled radiator, which not only adds distinction but is certain to receive more attention. There are more of these in the show than there has been for many years. They are meeting with a favorable response.

The Combination Body

The combination summer and winter body is not a strong factor, the exhibit of eighty different models of sedans indicating the necessary demand for these and the exhibit of not more than half a dozen so-called all-year bodies indicating how unsettled is that design. The so-called California top with its permanent overhead portion and removable tops for the doors and removable sides is not in great numbers, the added cost of approximately $500 involving a fairly high sales resistance. There is an unmistakable feeling that there should be a lower price for an all-year car.

With roadsters a commendable advance is dropping the folding rear seat, which so often was more of a talking point than a feasible design, and making worth while baggage carrying compartments in the rear. There are a few roadsters with ample space for suit cases, coats, golf clubs and robes. There is a broader field for the roadster if it is made more complete in these regards.

A point to be guarded against in winter tops as well as closed designs is the blind spot at the end of the windshield. The glass windshield wings on a few cars have an extra amount of attaching parts which constitute a blind spot. One or two examples of winter tops have front side curtains that are bad offenders and their use certainly courts accidents in city driving in stormy weather.

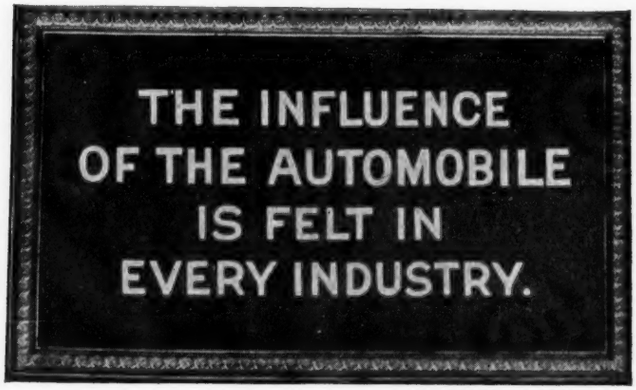
The road wheel is still an unsettled feature in the industry, not so much whether artillery, wire or disk types dominate, but rather the question of peripheral weight. Europe never has agreed with us in the heavy demountable rim and the handicap it places not only on the acceleration but deceleration. The demountable rim was a first essential until the cord tire has to such an extent eliminated tire changes. The demountable wheel has reduced peripheral weight, but it has largely been confined to wire and disk types. Not a few engineers are seriously considering whether or not the penalty of the demountable rim is a too heavy one to-day. In appearance the demountable rim never has been attractive and some of the wheels at the show are really eyesores. Disk wheels are still too expensive.

Leaving off the runningboard and using front and rear steps is more general than heretofore, but this again is to be interpreted as an easy step to a merchandising talk. Some of the steps are veritable wash basins and look the part, while others are fashioned more after carriage art, and unquestionably add a note of smartness. There is a possible danger factor where the steps are too large and have suspicious looking sharp edges that might injure a passing pedestrian.

The Salesmanship

Coming, as the show does, at a time when every sales inquiry should be made the best of, one criticism must be made, namely, the regrettable lack of full information on the part of the salesman in the exhibit booths. These salesmen should know the meritorious parts of the car, but too often they do not. Too often they cannot point out the good production features. Too often they are ignorant of the good maintenance points. Wheelbase, tire sizes, number of cylinders and number of speeds are not enough. The average show visitor who is looking over the cars with buying in mind should be given all the information desired.

The psychology of the salesman in the exhibit booth is too frequently almost negative. In a few stands the apparent rôle was to approach everybody before they reached the car or chassis and ask what point of the car they were interested in. That is not good psychology, as many were observed who wanted to shop around and it was quickly noted that too insistent attention of the salesman was resented. The analytical salesman does not thrust himself on the prospect but rather studies him, notes what part of the car or chassis he is interested in and then studies the exact moment when his assistance is needed and is ready at that second. The salesman should realize that the show visitor who pays his 75 cents for the privilege of attending the show to see the cars has a certain privilege in each exhibit space. The spaces are the display windows of the show. Give the visitor his free right to use them. The old question of "Are you interested in cars?" is not heard, but there is need for better show salesmanship, for studying the visitor and endeavoring to assist him and not interfering with him.



One of the slogans at the New York show

Engines Exhibited at New York Show

By P. M. Heldt

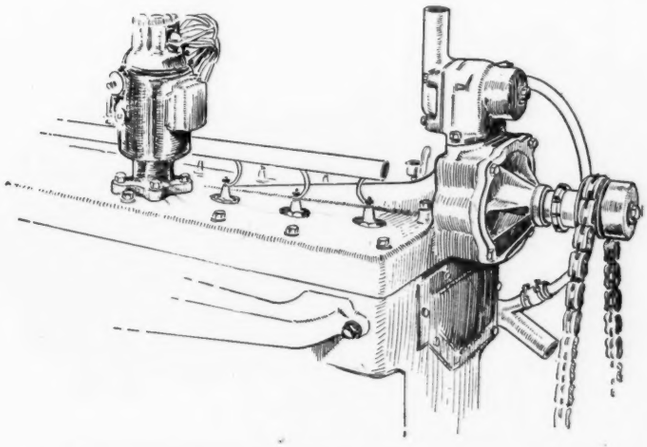
CONTRARY to expectation there are no surprises at the automobile show this year; that is, entirely new models of which announcement was withheld until the show opening. Of cars which are exhibited this year for the first time there is a fair number. There are first of all the Packard single six, already fully described in these columns, and the new Pierce-Arrow car which will be the only passenger chassis model of the Pierce-Arrow company the coming year. There are two newcomers in the eight-cylinder class, the Lafayette and Lincoln. The Fergus, while not an entirely new design, shows many changes as compared with last year's model. In the medium priced class there is, first of all, the new Lexington model equipped with the new Ansted engine, which was specially designed for operation at high speed and which embodies a new idea in valve actuating mechanism. There is also a new Oldsmobile, a four, but its engine presents such striking family resemblance to certain other products of the General Motors Corp. that to one in search of novelties in engine and accessories the design is somewhat disappointing.

Leaving the show proper for a few moments and visiting some of the nearby hotels whose lobbies have been converted into show rooms for the week, we find some of the most striking novelties. This is not at all surprising when it is considered that at the show members of the N. A. C. C. receive first consideration and applicants for space are accommodated in the order of their last year's production; hence the oldest and the largest manufacturers are represented at the Palace while the smaller and newer concerns have space at the hotels, and as conservatism generally grows with age and volume of production it is only natural that the most radical models are seen at the hotels. This applies to such cars as the Ace, the Parenti and the German Sauer. Then there is another class of new cars at the hotels, designed along conservative yet up-to-date lines, such as the Navarre and Ferris, which will probably be built on a moderate scale mainly for use as closed cars.

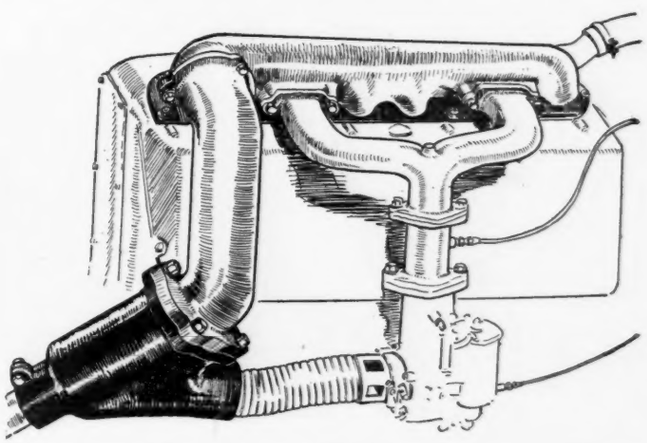
After this brief outline of the outstanding novelties, we may pass to a consideration of engineering features in connection with engines and engine appurtenances exhibited by cars at the show and especially those shown in chassis form. It may be mentioned that some of the leading firms, notably the Hudson and Marmon companies, do not exhibit a show chassis this year. Whether the reason is a desire to save the cost of a sectioned and highly polished show chassis—which is by no means small—or whether it is believed that the available space can be utilized to better advantage by exhibiting a full line of the models offered, is a question, but it is most likely that the last mentioned reason is the real one, for to judge by rumors of the cost of the models exhibited at the Marmon stand economy was not an important consideration in the preparation of that exhibit.

In its new single six the Packard Motor Car Co. has struck a new note with respect to location of engine accessories. With the constant increase in the number of these accessories their arrangement has become somewhat of a problem. When placed on the sides of the engine between the crankcase and the frame they not only interfere with access to the engine but often are hard to get at themselves. In the new Packard the ignition unit is placed centrally on top of the engine and the pump, which is of the water circulation type, together with the fan and thermostat form a unit also located high up in front, so that there are few auxiliaries on the sides of the engine. The control rods from the ignition unit and carbureter are, moreover, very neatly arranged, running substantially parallel with the engine axis, which makes them unobtrusive and gives a clean cut engine layout.

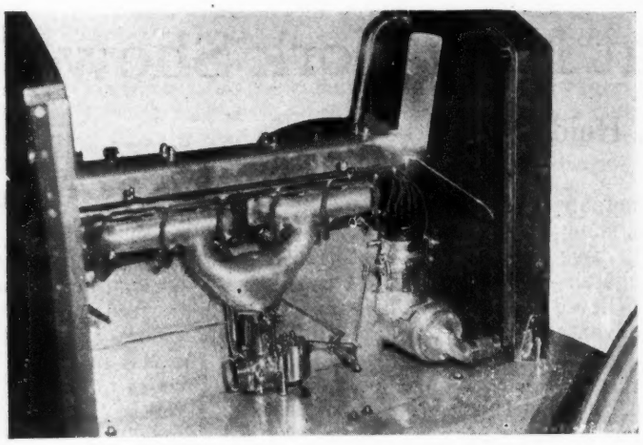
In respect to control rod connections many designers still have much to learn. In a great many cars either the carbureter or the ignition unit is located on the opposite side of the engine from the steering gear, and this requires running the control linkage around—or through—the engine. Now that an interconnection between the throttle valve and the pressure relief valve on the lubricating system is provided on many cars, this linkage has become even more complicated than formerly. On one car no less than eleven ball joints were counted, and as these were of the type in which the socket is spun over, which usually gets very loose after two or three years' service, such cars naturally age very rapidly. Of course, it is not a great expense for the owner to put in a complete new set of these ball and socket joints, but the average owner will not take the trouble, though the rattle will annoy him.



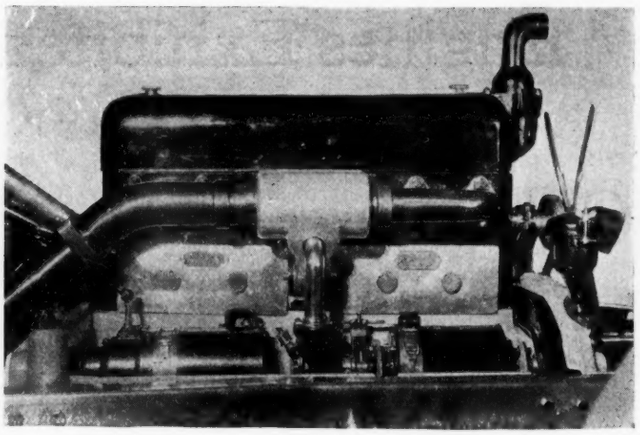
Packard places accessories above rather than at the sides of the engine



On the Roamer the exhaust pipe runs conveniently near the carbureter for a hot-air connection



Left-hand side of Fergus engine



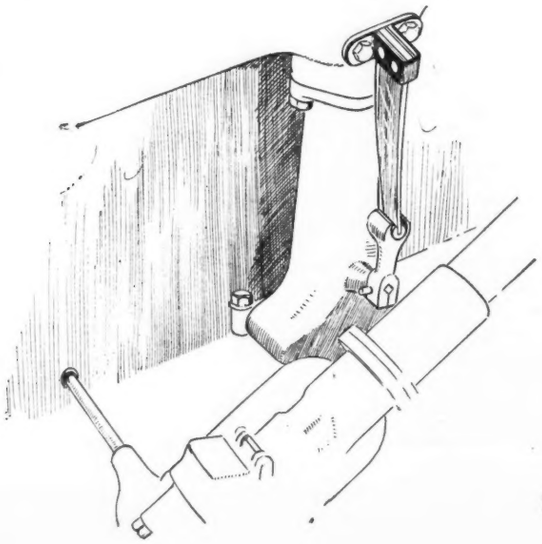
Exhaust side of Pierce-Arrow engine

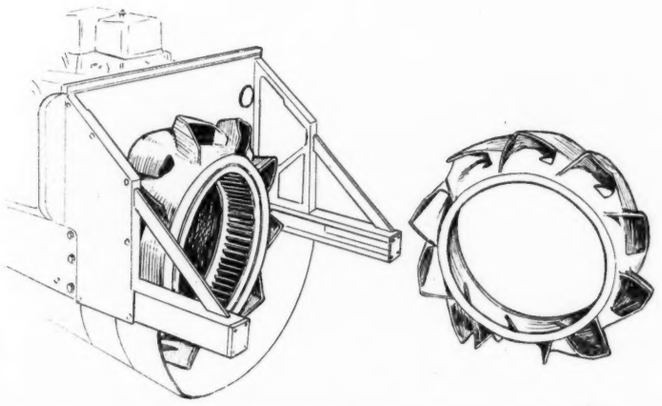
Where connections have to be made from the steering gear on one side to auxiliaries on the opposite side of the engine it is often a good plan to carry a control shaft right through the engine, either through the crankcase or the cylinder block. Such an arrangement is now found on quite a number of cars, notably the Templar. Whatever exposed linkages there are should be arranged in a neat manner, the individual links preferably in the three main planes. The Italians are pastmasters in the art of neat design, but Mr. Ferguson in the Fergus car has shown that the Latin race has no monopoly on the ability to produce simple looking and attractive layouts.

Whenever there appears some simple improvement whose advantages are obvious, it is remarkable how quickly it is taken up by designers generally. It is now hardly a year ago that attention was first called to the practice of providing oil cocks with extension handles so that they can be reached without getting down under the chassis, yet at the show these extension handles are found on many cars. There seems to be a tendency to discard the float type of oil gage. In the new Pierce-Arrow, for instance, the oil sump is provided with two try cocks whose stems extend up through the continuous web of the crankcase into a position where they can be easily reached. As there is no sod pan, the cocks can be easily seen, and as they extend straight out from the side of the oil pan they can be easily cleaned if they become clogged with dirt. No doubt this method of determining the oil level in the case, while ordinarily not as exact as the float indicator, is on the whole more reliable. It was noticed that the bayonet type of oil gage, which heretofore has been used almost exclusively on truck engines, is rapidly coming into use also on passenger car engines, particularly those of the less expensive type.

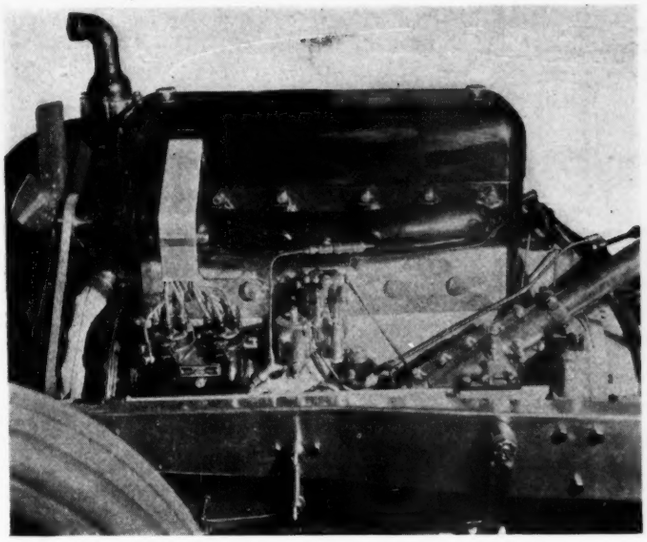
Valve enclosure came first in connection with L-head engines. Several years later makers of T-head engines found that in order to hold their own they also would have to enclose the valves, though, since valve chambers had to be provided on both sides of the engine, this involved a greater increase in weight than in the L-head type. The valve-in-head type with tappet rods extending up one side of the engine resisted longest the general tendency to enclose all working parts, but finally the hour of the exposed long tappet rod has struck too. In certain engines, such as the Weidely, the tappet rods extend up through a chamber whose walls are cast integral with the cylinder block which gives generally the neatest construction, but most designers cannot convince themselves that the very considerable increase in weight necessitated by this construction is warranted. In the Dorris the rods are enclosed individually in tubes extending between the crankcase and an overhanging portion of the head. This, of course, hides the moving parts, but it does not give that simplicity of outward form which is the aim of many designers. On the Buick and several other cars sheet metal covers are secured over the side of the engine on which the tappet rods are located. In the Buick the cylinder block is cast with offsets or steps along the vertical center line at both ends, against which the metal cover fits.

The bell housing construction is constantly coming into

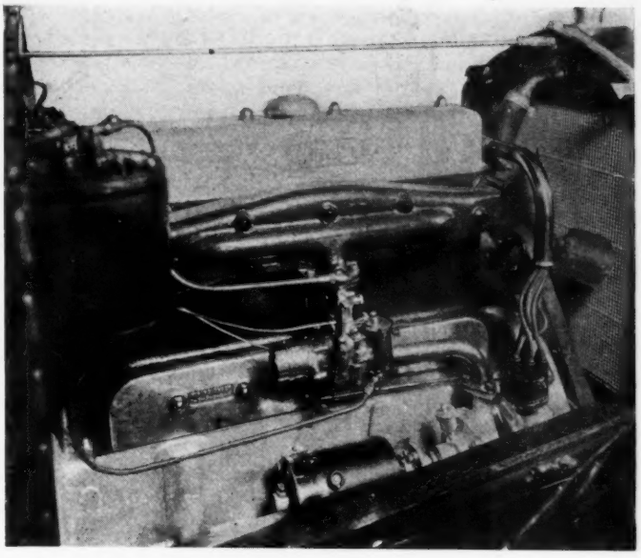




To the left—Thermostat on Fergus car for controlling exhaust heat.
Above—Aeroduct casting over Sirocco fan on Holmes engine



Inlet side of Pierce-Arrow engine

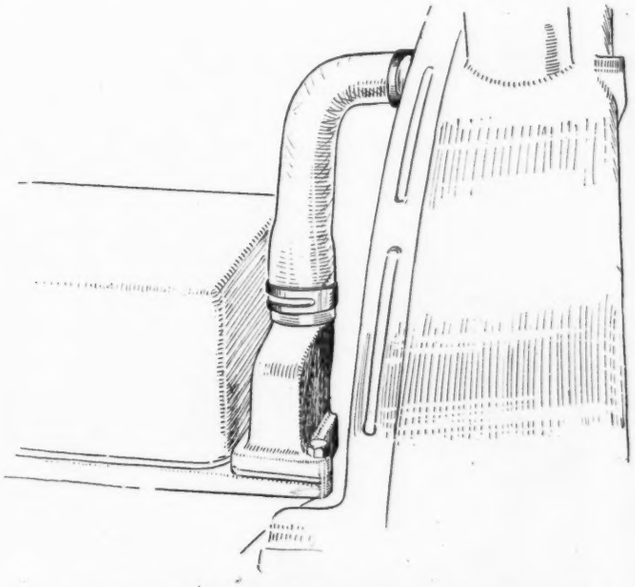


Valve side of Northway engine

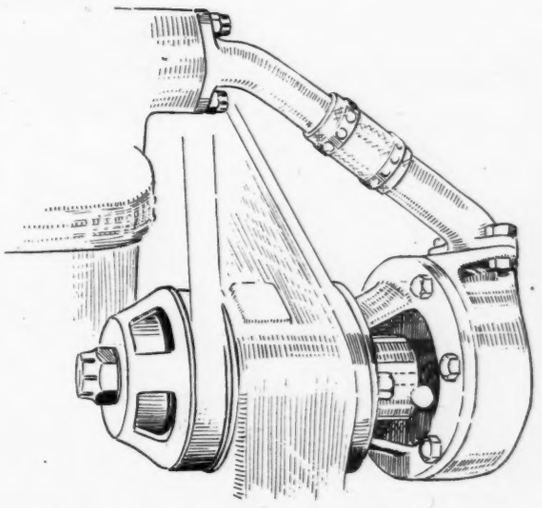
more general use, among those who have adopted it recently being the Pierce-Arrow Motor Car Co. Although the Pierce retains the separate transmission amidships, it now has an enclosed flywheel and clutch, and this has eliminated the characteristic Pierce engine suspension by means of two drop forged carriers. At the front the drop forged carrier is retained, but at the rear integral arms extend from the bell housing and rest upon lugs riveted to the frame, the holding down bolts passing through the arms and lugs being provided with coiled springs under their nuts to provide flexibility.

In reports of the European shows this year attention was called to the growing popularity of continuous webs between the engine crankcase and the chassis frame, and the same tendency is observable here. The sheet metal underpan is always more or less of a nuisance, because of the amount of dirt it will collect and because in some cases when parts or tools drop into it they are hard to get out again. Besides, it slightly reduces the road clearance and without it the engine can be set correspondingly lower, which makes for a lower center of gravity. Practically all of the new high grade cars with vertical engines have continuous webs, and where they are not cast integral with the crankcase, filler plates are sometimes bolted between the crankcase and the frame, as in the Fergus.

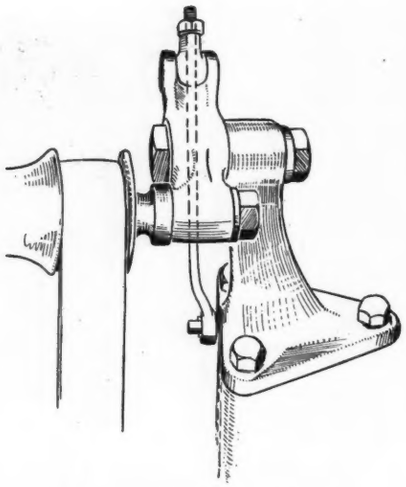
When an overhead valve engine has a cover over the valves, something of a problem is presented by the water outlet from the engine jacket. As such covers have been applied only during the last year or two the problem is a relatively new one, and this is reflected by the variety of solutions worked out. In the Stephens six-cylinder engine, which is related to the Moline tractor engine, the valve cover is jacketed and the outlet header or manifold is cast integral with the cover. One explanation of this design is undoubtedly that in a tractor engine, which works constantly very close to full capacity, the valves and their adjacent parts get very hot, and jacketing the cover undoubtedly tends to keep them cool. In the Buick there are two small indentations of the cover on one side where the water return manifold bolts to the cylinder head. In the



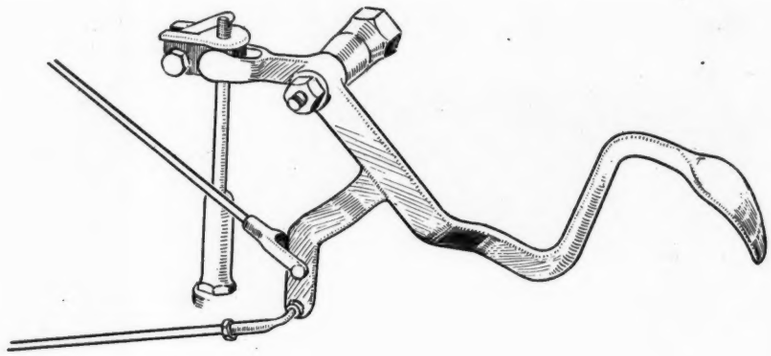
On the National overhead valve engine the water outlet from the head is through a [illegible] sion of the head casting



On the Du Pont the fan pulley is behind the gear case and the water pump in front of the casing on the same shaft



Positive fan adjustment on Templar

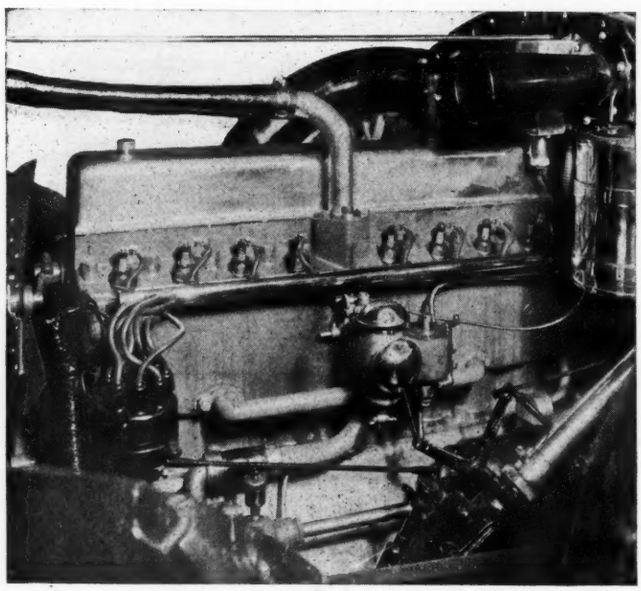


Stearns accelerator pedal has several crooks, but its connections are simple

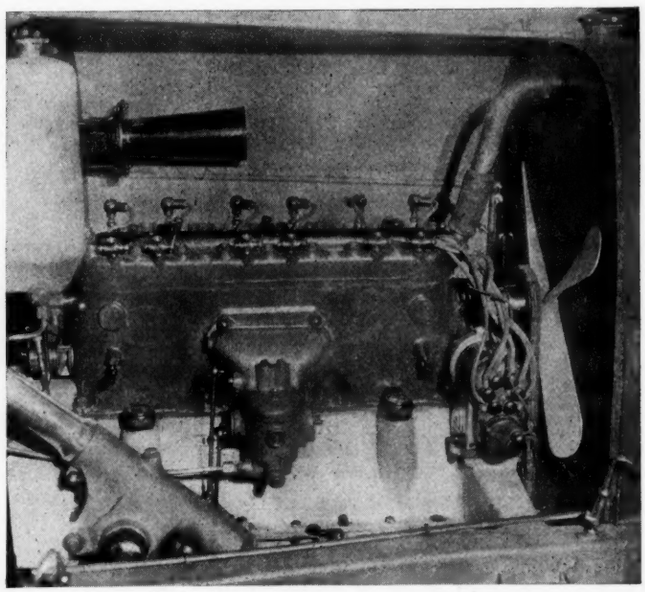
Scripps-Booth the outlet from the cylinder head is under the valve cover and the water is led through a pipe fitting secured into the side of the cover at the middle of its length. On the National and several other engines the head casting is slightly extended at the front, beyond the reach of the valve cover, and the water return pipe bolts to this extension. This latter solution is undoubtedly the simplest and neatest, and the only reason for some of the others probably is that the cylinder head castings were already in existence when the problem of covering the valves arose.

While on the subject of water connections mention may be made of some expedients resorted to in order to get uniform distribution of flow and consequently uniform cooling action. In most cases the pump is mounted near the front of the engine, which makes it most convenient to have the water inlet near the front, and the outlet from the cylinder jacket to the radiator also comes most naturally either at the middle of the head or some point forward thereof. Consequently there is danger of sluggish circulation in the rear jackets, and as it is the hottest cylinder that causes trouble from knocking and faulty lubrication, it is important to take precautions against this eventuality. In the Du Pont car, in which the pump is located in front of the engine and driven from a forward extension of the accessories shaft, the water inlet connection to the cylinder block is made at the front end but a pipe extends through the jacket to the rear, and as the outlet is also at the front the water is compelled to flow through the entire length of the jacket. The somewhat similar arrangement on the aluminum engine of the Premier car is well known and is shown to good advantage in a cut-away model at the Grand Central Palace. On the engine of the six-cylinder Kissel car, on the other hand, where the pump is located at the side of the engine forward, the inlet pipe is run along the side of the cylinder block and the water enters the jacket at the rear.

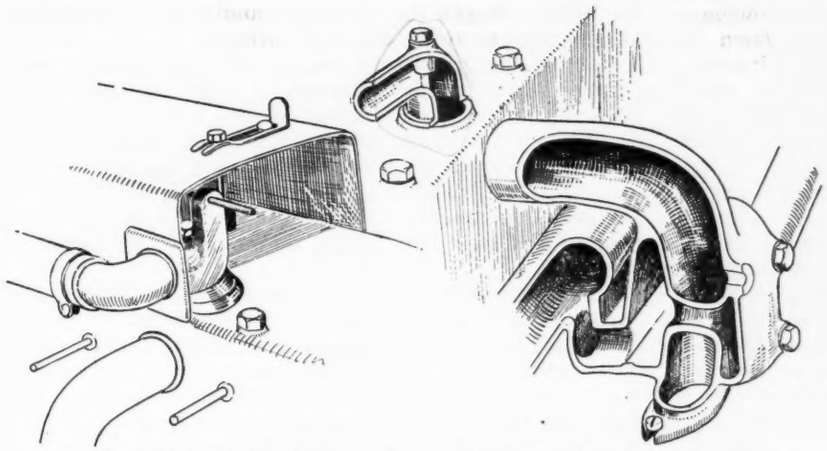
Where the inlet manifolds are jacketed it makes for simplicity and neatness if the inlet to and outlet from the jacket are through ports alongside of the main inlet ports of the manifold. In the new Pierce-Arrow, water from the engine cooling system enters the jacket in this way, and in the Lafayette, exhaust gas. In connection with manifolds it seems to be a good plan to hold them in place by means of studs whose nuts are outside the plane of the manifolds, as such nuts can be screwed in place and removed much



Carbureter side of engine on Kenworthy car



Carbureter side of engine on Fiat car



On the left is sketched the water outlet from the cylinder head of the Scripps-Booth and on the right the sectional inlet and exhaust manifolds of the Oakland

more conveniently than nuts passing through lugs or ears cast on the manifold and lying close up against the cylinder block. Moreover, if the nuts press on clamping pieces or bridges between sections of the inlet and exhaust manifolds, as in the Scripps-Booth (Northway engine), they will not get so hot and are not so apt to rust tight as if bearing directly against a part of the manifold. On the Fergus engine the exhaust manifold is held in place by five studs passing through cast-on bosses the whole depth of the manifold, thus bringing the nuts into accessible positions.

Although the hot spot and exhaust jacketed manifolds are constantly gaining in favor there are still many engines which merely preheat the air before it enters the carbureter and do not apply any exhaust heat to the mixture after it is formed. In some designs the flexible pipe connection between the hot air stove on one side and the carbureter on the other side is inordinately conspicuous. In the new Pierce the hot air is carried right through the cylinder block between cylinders Nos. 3 and 4, and in the Roamer, using the Duesenberg engine, the connection is short and direct, as shown by the sketch herewith, the exhaust and inlet being on the same side of the engine as the carbureter.

At each show in recent years—and the present one is no exception—there have been exhibitors who in the course of the year had changed from splash to force feed lubrication. With this change often goes the adoption of oil pressure control in proportion to throttle opening. This method of lubrication control is in use on the Chalmers and Liberty, the Kissel and Stearns among others. On the Stearns car the linkage from the accelerator pedal and throttle lever rod to the throttle valve and oil pressure relief valve is particularly neat, and is sketched herewith.

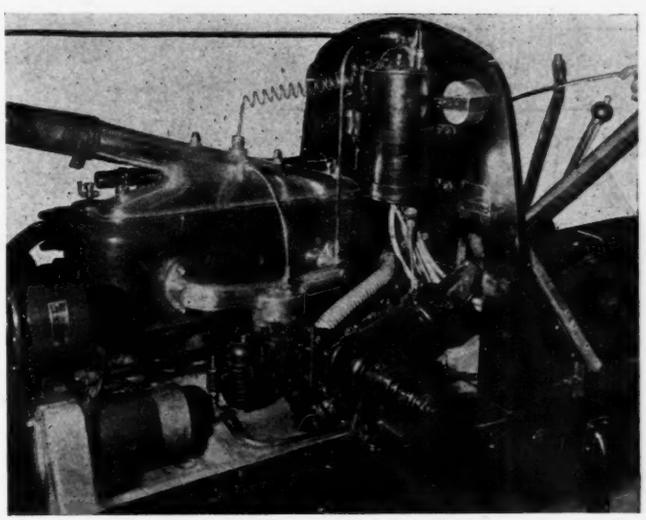
Restriction of the outlet passage from the engine space has long been a cause of poor cooling of engines, or, perhaps, it would be more correct to say that this was formerly a frequent cause of poor cooling, because the fault has often been pointed out and has been remedied on most water cooled cars. One of the improvements in the Holmes air cooled car aims at eliminating this fault. This car has a centrifugal type of fan, forming the flywheel, and as the outlet from this fan is in a radial direction and the space between it and the mud pan and other parts of the enclosure is restricted the circulation of the air has been greatly hampered. By installing what is called an aeroduct (see sketch) the rate of air circulation at any given engine speed is said to have been practically doubled. This device consists merely of an aluminum casting surrounding the fan flywheel on its circumference, in which are formed a series of air passages which gradually change the direction of the air from perpendicular to parallel the car axis. Holmes has also done away with the rather intricate valve mechanism formerly employed and now uses a plain tappet and rocker motion.

It was noticed that on the high grade cars the use of steel pressings for the oil pan, gear cover and such parts is scrupulously avoided. From a strictly practical standpoint pressed steel would seem to be as good as aluminum, as the constant pressure of oil will keep it from rusting, and if there is any difference in weight in favor of aluminum it must be very slight. Aluminum, however, looks better.

A feature of interest from a maintenance standpoint was observed on the Mitchell six-cylinder engine, in the form of an eye bolt in the cylinder head casting by which it can be easily removed when necessary. Although this feature is not new with the Mitchell, it does not seem to have been copied so far. The nearest approach to it in other engines noticed by the writer is in the form of overhanging lugs at the ends of the head casting which afford a grip when the head is to be removed.

The Oldsmobile eight has the generator mounted centrally in front and driven by belt, the fan being mounted on an extension of the armature shaft. This is similar to the construction used on the Nash. Belt drive of the generator was also noticed on one other car where the fan was not combined with the generator. While there is some objection to a non-positive drive of the generator it must be remembered that the power consumption of the latter is much less than that of the average fan. The average generator delivers not over 20 amperes at about 7 volts, which is equal to 140 watts, and at 50 per cent generator efficiency the power required to drive the generator is only slightly more than one-third of a horsepower.

Quite a few designers now place the driving pulley for the fan belt on the accessories drive shaft *behind* the gear housing. This has the advantage that it eliminates one shaft outlet from the gear housing and one chance for oil leakage. Thermostats are finding additional applications on automobile engines. Thus on the Fergus engine there are two serving novel purposes. One is in the form of an aluminum rod inside the hollow overhead camshaft, which,



Left-hand side of engine on new Du Pont car

as it expands from the growing heat of the engine, engages the friction clutch by which the fan is driven from the camshaft. When the engine is cold the fan does not rotate, or at least not at any speed. The other thermostat, which is of the compound metal strip type, extends down the side of the exhaust pipe and controls the opening of the exhaust bypass through the inlet manifold jacket.

In a class by itself is the small Fiat car which has an engine of probably not much over 2½ in. bore. This, of course, is a car designed for economical operation, and as low first cost should go with low running expense, some of the features found in the larger Fiats have been eliminated. Thus the fuel, instead of being carried in a rear tank from which there is pressure feed to the carbureter, is contained in a flat tank on the forward side of the dash. With the low consumption of these small engined cars a sufficient supply can be carried in this way, especially since the dashboard and the radiator opposite it are very large as compared with the diminutive engine.

Fan tension adjusting means are sometimes a weak point. If the cranked support is used and adjustment made by swinging the crank around its stud and then clamping it on same, the tension often loosens quickly owing to irregularities, such as a heavy lap joint, in the belt. In the Templar, although the fan is supported by a crank, adjustment is made by a positive device in the form of a pullrod with nut, as shown by the accompanying sketch.

On the Navarre, which is a new car built in Springfield, Mass., an outside water inlet connection to the cylinder is eliminated by bolting the pump up against a water passage in the crankcase which communicates with a vertical passage through the cylinder block. This vertical water passage is at the middle of the length of the engine.

Refinements in Chassis Construction

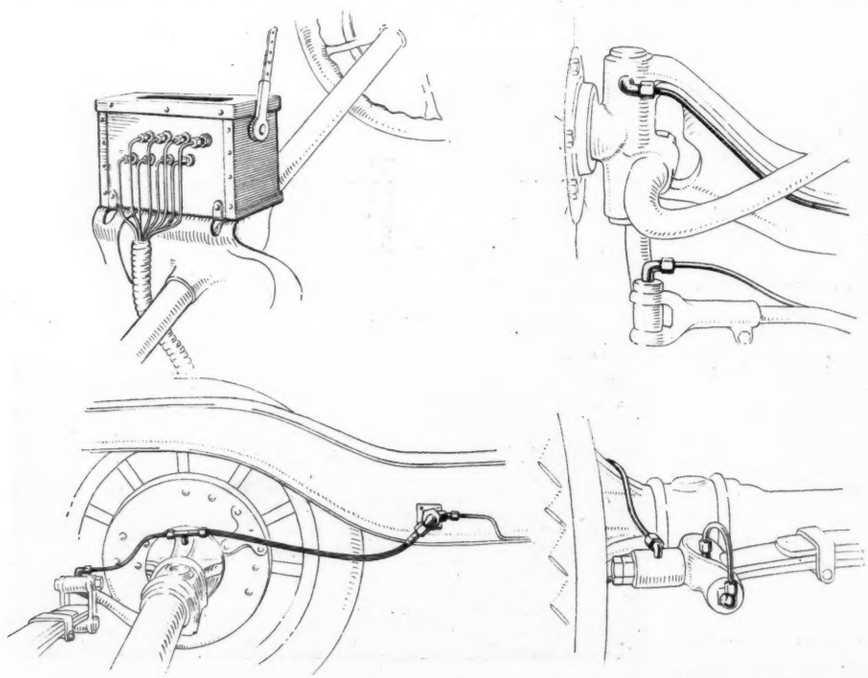
By J. Edward Schipper

HIGH lights in the development of chassis design as indicated by the show exhibits are improved chassis lubrication, greater simplicity, rattle elimination, lightness, increased strength due to the better disposition of materials and greater accessibility of adjustment.

Taken generally, engineers visiting the show are impressed with the cleaner and neater appearance of chassis, particularly in the lower and medium priced field. It is noticeable that a few of the newer cars in the very high-priced field have almost the same simplicity as the lower priced cars, but being larger and heavier are not so prone to use the Hotchkiss drive and consequently employ torque members which serve to make the chassis seem of a little more complicated construction.

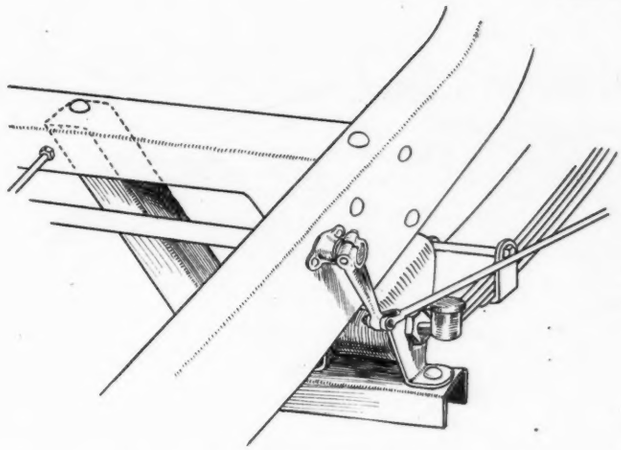
There is a very laudable effort throughout to clean up the details and lighten the chassis. This is being accomplished generally in one of two ways, either through the use of very neat drop forgings or by making a part which formerly served one purpose perform the work of two. In many instances these two ideas are combined and a drop forging is made which perhaps acts both to support the gasoline tank and the spare tire or perform some other dual service, thus saving weight.

The outstanding feature of chassis development, however, is the effort toward the simplification of chassis lubrication from the owner's standpoint. There is not a manufacturer who does not realize that vigorous steps are necessary on this part of chassis design to bring it up to a par with other parts of the car. The result is that on practically every chassis at the show some improvement in this respect is noticeable. There are probably fifty or more makes of cars shown with the Alemite system, a great many having adopted this oil-gun method during the year. The Saxon car is shown with the Romon automatic chassis lubricator as standard equipment.

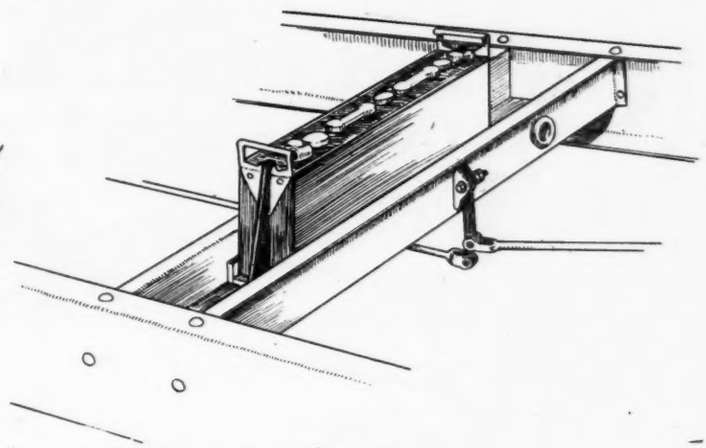


Romon chassis lubrication system on Saxon car and installation details

This system provides centralized lubrication for the entire chassis. In the Saxon installation the box-like reservoir is mounted on the steering column just behind the dash. The device is operated by periodically (about once every 500 miles) rocking a lever which works on a ratchet rotating the camshafts inside the reservoir. These in turn drive a series of pumps which are connected to the copper leads which run to all parts of the chassis. The pumps are plunger type and are depressed by the cams and return to normal position by means of springs. The oil is forced against a ball check in the intake and through a delivery passage into oil lines leading to the various points on the chassis which require lubrication. Ball checks are also located at these points so that the oil forced to these points remains there and also remains in the line between the reservoir and the bearings,



Unusual construction of spring bracket on Cleveland car



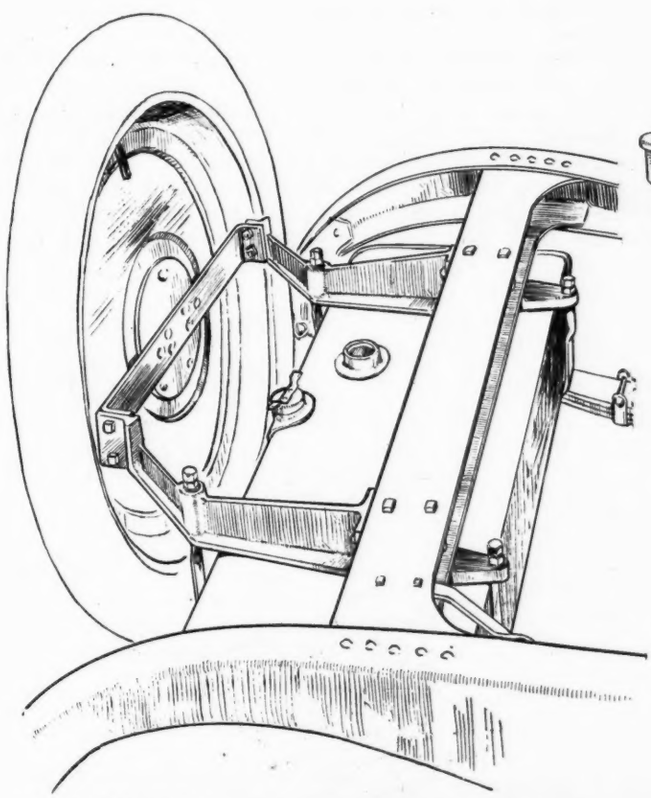
Cross member of frame serves as battery carrier on Briscoe

insuring immediate movement of the oil on operation of the pump.

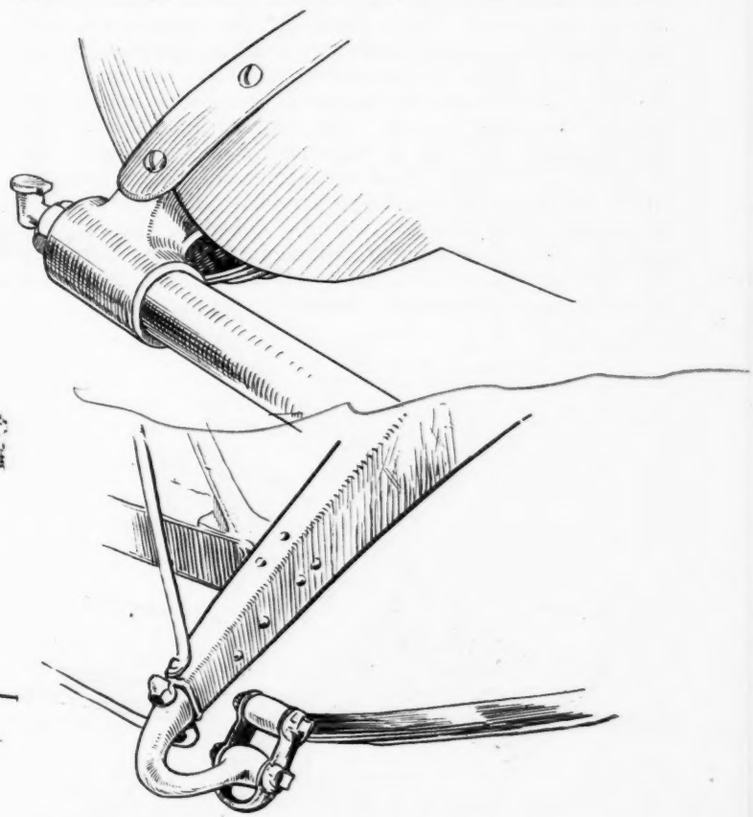
To take care of the various steering, spring and axle points a number of fittings of a standard character are employed. The system displaces all the grease and oil cups on the chassis, the oil being lead direct to these points by the copper tubing and by flexible tubing connections to parts which have motion relative to the chassis frame. There are also special swivel connections at necessary points so that none of the tubing is under stress due to the oscillation of the springs, movement of the steering gear, etc.

The Fergus cars, with the centralized lubrication scheme, familiar to readers of AUTOMOTIVE INDUSTRIES, was also on exhibit and furnished another example in which a manufacturer has made the effort to eliminate the troublesome and often neglected task of chassis lubrication. This centralized tank takes care of the system by gravity, the flow of oil being from a tank which the makers state requires filling but once in every six months. On this car the springs are covered with leather boots and are oiled from the central system.

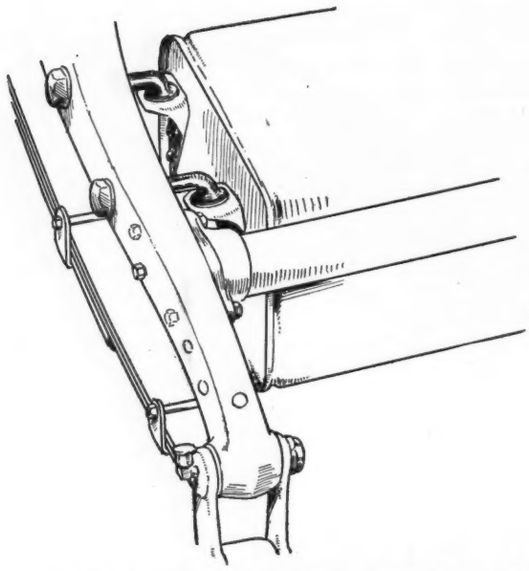
While the above mentioned cars offer some good examples of the solution of the chassis lubrication problem, there are some bad examples which may be justly criticized. There are some grease and oil cups still located at points where it is doubtful if even a vigilant owner would find them. After he had found them he would have to disregard the necessity of soiling his clothing and suffering great inconvenience in order to get the lubricant to the



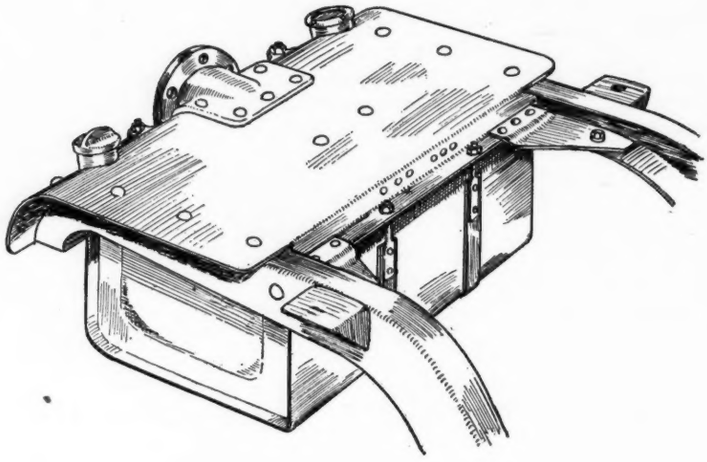
Combined tire carrier and tank support on Davis car



Tubular front cross member on Cole chassis. Below—Braced rear end of frame channel on Dorris



Tubular rear cross member and flexible tank support on Templar



Frame stiffening plate and tire carrier base on Stearns

points in question. Probably the location which is the greatest offender is inside the brake drum where some axle manufacturers still place the grease cup which takes care of the rear wheel bearing. Even on the stripped chassis it is hard to reach these cups, but when the body is mounted, the fenders put on, and road dirt has collected, it is a foregone conclusion that these points will be neglected. In fact the manufacturer might about as well save himself the price of the cups.

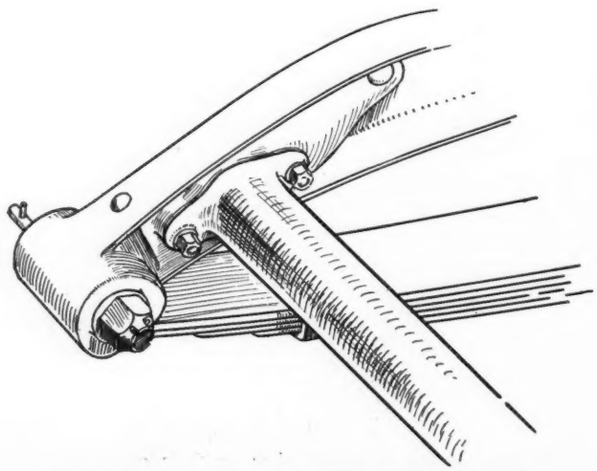
In simplifying the chassis, or in other words, cutting out the unnecessary parts, there have been some noticeable achievements. These have been particularly the case where the designer has been able to make one part do the duty of two. For instance, there are a great many instances where the cross member of the frame has served also as the anchor for the front rear spring hanger. On the Cleveland car this is very neatly accomplished. On the Briscoe the frame cross member has been extended and forms the front runningboard carrier. This is a nice bit of economy, but has the possible objection that in the event of the all-too-common collision, the owner's repair bill will be somewhat heavier, should he happen to be struck at this particularly vulnerable point.

Another clever bit of manufacturing economy on the Briscoe, which is noticeably good in this respect, is the use of the central U cross member as the battery retainer. This eliminates the customary cradle and certainly gives a firm support to the battery and at a very accessible point of the chassis.

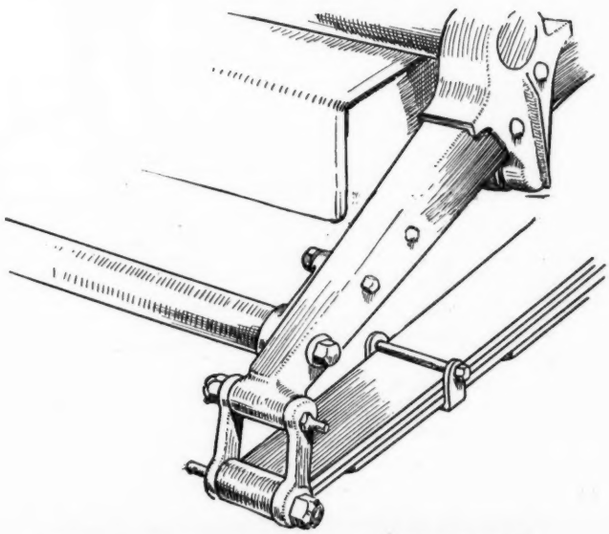
On the Davis car there is a combined tire carrier and tank support which is a good example of making one part suffice for two purposes. Others make the rear cross member act in this capacity, either supporting the tire carrier, the tank or both. The new Lexington, which makes its first real public appearance at the show, uses the built up Z bar somewhat like the Marmon frame, but bolted instead of riveted for easy replacement in case of collision or other damage. In this type of frame the splash aprons, etc., are structural members.

There has been an increased stiffness in all types of chassis. One of the points which illustrates this quite clearly is in the increased use of tubular cross members both front and rear. On the Willys-Knight these are used on both ends of the chassis and are light, while at the same time they are good stiffening members and in the

(*Continued on page* 78)



Front cross member on Willys-Knight chassis



Rear tubular cross member on Willys-Knight chassis

8,887,572 Cars and Trucks Registered in the U. S. During 1920

A net increase of 1,291,096 vehicles is recorded, making a gain of 17.16 per cent. There is now a car for every 12 persons in the country. There were approximately $75,000,000 collected in fees. Huge climb in registration figures fails to show effect of business depression.

THERE are now 8,887,572 automobiles and trucks registered in the United States. This figure surpasses by over 300,000 most of the estimates made at the beginning of the year. While it was freely predicted that the number of vehicles would go well over 8,000,000, it was not expected that the 9,000,000 mark would be threatened so closely as it has been.

The figures show a gain of 1,291,096 over 1919, a gain of 17.16 per cent. On the basis of these new registration figures and of the 1920 census statistics, it appears that there is one vehicle for every 12.21 persons in the country. Thus, utilizing the full capacity of all the trucks, as

Registration of Motor Vehicles

STATE	Total Net Registration	Non-Resident and Re-Registration	Passenger Cars	Commercial Cars	Motorcycles	Chauffeurs and Operators	Total Fees
Alabama	74,637	3,123	61,941	12,696	1,035	.....	$832,980
Arizona	34,559	1,816	29,826	4,733	542	416	192,245
Arkansas	59,082	.....	.....	.....	.....	.....	.....
California	568,892	126,827	534,814	34,078	20,047	865,699	5,554,265
Colorado	128,951	10,881	121,223	7,728	3,364	9,814	818,938
Connecticut	119,134	.....	95,123	24,011	6,543	.....	1,561,191
Delaware	18,300	.....	.....	.....	606	.....	329,980
District of Columbia*	9,712	.....	8,403	790	519	7,468	54,231
Florida†	57,000	.....	.....	.....	.....	.....	.....
Georgia	144,422	2,028	.....	.....	1,688	5,147	1,918,512
Idaho	50,750	.....	.....	.....	.....	.....	.....
Illinois	568,759	.....	503,762	64,997	10,597	63,451	5,897,879
Indiana	332,707	.....	300,226	32,481	8,823	9,758	2,029,103
Iowa	437,300	97,908	.....	.....	.....	.....	7,507,202
Kansas*	265,396	5,903	248,322	17,074	2,972	.....	135,214
Kentucky	112,685	.....	99,426	13,259	1,543	5,000	816,159
Louisiana	66,000	.....	59,400	6,600	500	.....	.....
Maine	62,907	4,636	55,395	7,512	1,566	78,539	818,756
Maryland†	105,000	.....	.....	.....	.....	.....	.....
Massachusetts	304,631	35,346	253,245	51,386	15,143	361,579	3,860,232
Michigan	412,717	35,640	366,946	45,771	8,011	74,648	5,694,486
Minnesota*	64,312	2,717	.....	.....	1,158	3,277	151,382
Mississippi	64,000	.....	.....	.....	.....	.....	.....
Missouri‡	295,817	16,025	.....	.....	3,969	26,627	.....
Montana	60,646	.....	.....	.....	.....	.....	.....
Nebraska	223,000	.....	204,000	19,000	2,000	.....	2,070,144
Nevada	10,464	.....	.....	.....	76	.....	.....
New Hampshire	34,680	4,800	30,240	4,440	2,542	44,093	645,968
New Jersey‡	226,459	.....	202,943	23,516	.....	.....	.....
New Mexico	22,109	.....	.....	.....	219	.....	200,000
New York	651,796	.....	543,808	108,988	29,342	358,022	8,511,597
North Carolina	140,860	.....	127,415	13,455	1,418	.....	1,785,000
North Dakota	90,840	10,100	89,385	1,455	898	.....	691,500
Ohio	616,800	16,000	534,800	82,000	21,050	.....	5,200,000
Oklahoma	204,300	.....	.....	.....	1,320	.....	2,393,788
Oregon	103,790	15,946	.....	.....	3,516	3,963	2,085,000
Pennsylvania	570,164	72,545	521,835	48,329	23,981	258,135	.....
Rhode Island	50,375	5,772	40,800	9,575	2,225	58,710	531,000
South Carolina	92,818	1,933	.....	.....	908	.....	527,868
South Dakota	122,000	.....	113,000	9,000	560	.....	768,000
Tennessee	101,852	.....	90,214	11,638	1,151	.....	1,215,776
Texas	427,634	.....	.....	.....	4,293	.....	.....
Utah	42,604	.....	37,042	5,502	.....	.....	.....
Vermont	31,625	.....	.....	.....	946	33,817	555,422
Virginia	134,000	10,000	101,800	13,670	2,233	5,520	1,825,000
Washington†	175,000	.....	.....	.....	.....	.....	.....
West Virginia	78,862	6,000	68,162	10,700	1,659	10,514	1,100,000
Wisconsin	293,298	.....	277,093	16,205	8,002	.....	3,127,073
Wyoming	23,926	.....	.....	.....	327	.....	267,179
TOTALS	8,887,572	485,946	5,720,589	700,589	197,292	2,284,197	$71,613,070

*Registration year ends July 1. Figures for Jan. 1. †Estimated. ‡Figures as of December 1.

Cars and Trucks in the United States, December 31, 1920

New York	651,796
Ohio	616,800
Pennsylvania	570,164
California	568,892
Illinois	568,759
Iowa	437,300
Texas	427,634
Michigan	412,717
Indiana	332,707
Massachusetts	304,631
Missouri	295,817
Wisconsin	293,298
Kansas	265,396
New Jersey	226,459
Nebraska	223,000
Oklahoma	204,300
Washington	175,000
Georgia	144,422
N. Carolina	140,860
Virginia	134,000
Colorado	128,951
S. Dakota	122,000
Connecticut	119,134
Kentucky	112,685
Maryland	105,000
Oregon	103,790
Tennessee	101,852
S. Carolina	92,818
N. Dakota	90,840
West Virginia	78,862
Alabama	74,637
Louisiana	66,000
Minnesota	64,312
Mississippi	64,000
Maine	62,907
Montana	60,646
Arkansas	59,082
Florida	57,000
Idaho	50,750
Rhode Island	50,375
Utah	42,604
New Hampshire	34,680
Arizona	34,559
Vermont	31,625
Wyoming	23,926
New Mexico	22,109
Delaware	18,300
Nevada	10,464
D. of C.	9,712
Total	8,887,572

well as the passenger cars, it would be perfectly possible at the present time for every individual in the United States to go for a motor vehicle ride at the same time.

Over $75,000,000 have probably been paid in fees during the last year, although figures from several states are not available at this time. With 14 states missing, however, an actual total of $71,613,070 is recorded as received by the various states from automobile fees. This incomplete sum alone exceeds the 1919 total by $10,000,000.

New York, as usual, took a spurt during the last six months and again leads in total registrations with 651,696, after trailing Ohio, Pennsylvania and Illinois at the mid-year mark. Ohio is second, while Pennsylvania pushes California out of the third place position, which it occupied last year.

Three facts are outstanding in an examination of the detailed statistics. West Virginia has jumped to the top of the list in percentage gain in registration, having the surprising advance of slightly over 57 per cent.

The large advance of Texas in the last year is another feature. Only one state, Ohio, showed a larger numerical gain. With its gain of 96,324, Texas stands second in the list of registration gains, while a year ago it stood only thirtieth in the same list. This state also advanced in the total registration list from tenth to seventh place.

The other distinct gain noted was made by South Dakota, which now has one vehicle for every 5.24 persons in the state. Last year, at this time, South Dakota stood fourth in this list with one car for every 7.20 persons. This year, however, it has passed Iowa, California and Nebraska and has taken its place at the top. California dropped back of Nebraska.

The accompanying tables tell the preliminary detailed story of the

Gain in Registration 1919—1920

Ohio	105,769
Texas	96,324
California	91,442
Illinois	90,321
Pennsylvania	88,047
Michigan	86,904
New York	80,134
Iowa	73,443
Oklahoma	59,800
Massachusetts	57,448
Wisconsin	56,317
Indiana	55,452
Missouri	51,454
Virginia	39,880
Kansas	37,644
New Jersey	35,586
N. Carolina	31,843
Nebraska	31,000
W. Virginia	28,659
Washington	26,225
Colorado	24,086
S. Carolina	22,675
Kentucky	22,044
Tennessee	21,430
Oregon	20,458
Mississippi	18,970
S. Dakota	17,372
Georgia	17,096
Alabama	15,739
Louisiana	15,000
Arkansas	9,632
Connecticut	9,483
Maine	9,482
Maryland	9,366
Idaho	8,530
N. Dakota	7,955
Utah	7,368
Arizona	5,580
Rhode Island	5,542
Vermont	4,818
New Mexico	4,032
New Hampshire	3,055
Wyoming	2,555
Delaware	2,148
Florida	1,600
Montana	1,321
Nevada	1,159
Dist. of Columbia	—25,688
Minnesota	—195,431
	1,291,096

Number of Persons Per Car, Dec. 31, 1920

State	Pop.	Cars and Trucks	Pop. per Car
So. Dakota	635,839	122,000	5.24
Iowa	2,403,630	437,300	5.49
Nebraska	1,295,502	223,000	5.74
California	3,426,536	568,892	6.04
Kansas	1,769,257	265,396	6.66
N. Dakota	645,730	90,840	7.14
Colorado	939,376	128,951	7.29
Nevada	77,407	10,464	7.39
Oregon	783,389	103,790	7.59
Washington	1,356,316	175,000	7.88
Wyoming	194,402	23,926	8.25
Idaho	431,826	50,750	8.52
Indiana	2,930,544	332,707	8.80
Michigan	3,667,222	412,717	8.91
Wisconsin	2,631,839	293,298	8.98
Montana	547,593	60,646	9.02
Ohio	5,759,368	616,800	9.34
Arizona	333,273	34,559	9.71
Oklahoma	2,027,564	204,300	9.72
Texas	4,661,027	427,634	9.79
Vermont	352,421	31,625	11.29
Illinois	6,485,098	568,759	11.41
Missouri	3,403,547	295,817	11.51
Connecticut	1,380,585	119,134	11.59
Rhode Island	604,397	50,375	11.99
Delaware	223,003	18,300	12.19
Maine	768,014	62,907	12.21
Mass.	3,852,356	304,631	12.61
N. Hamp.	443,083	34,760	12.78
Maryland	1,449,610	105,000	13.79
New Jersey	3,155,374	226,459	13.89
Utah	449,446	42,604	15.00
Penn.	8,720,159	570,164	15.45
New York	10,384,144	651,796	15.78
N. Mexico	360,247	22,109	16.51
Florida	966,296	57,000	16.93
Virginia	2,306,361	134,000	17.20
N. Carolina	2,556,486	140,860	18.15
S. Carolina	1,683,662	92,818	18.25
W. Virginia	1,463,610	78,862	18.59
Georgia	2,894,683	144,422	20.00
Kentucky	2,416,013	112,685	21.20
Tennessee	2,337,459	101,852	23.08
Mississippi	1,789,384	64,000	27.91
Arkansas	1,750,995	59,082	29.70
Louisiana	1,797,798	66,000	29.82
Alabama	2,347,295	74,637	31.49
Minnesota	2,386,271	64,312	37.20
Dist. of Col.	437,571	9,712	45.00
Totals	105,683,108	8,887,572	12.21

huge 1920 increase. In the Statistical Number of AUTOMOTIVE INDUSTRIES will appear the revised figures for December 31, which will comprise an exact and accurate record for every state. Only minor changes will be made, however, as the figures in the accompanying tables are essentially correct, in most cases being exact.

The difficulty of obtaining accurate registration figures has been commented upon in previous years. Not only does every state law differ from that of every other state, but many states make wholly inadequate provision for administering effectively the laws that they have. The only final remedy for the confusion which now exists, of course, is a uniform national registration law.

In the meantime, however, AUTOMOTIVE INDUSTRIES has conducted an extensive investigation with a view to rendering its registration statistics as accurate as is humanly possible under present conditions. The registration laws and the methods of administering those laws in every state have been investigated, in most cases by personal visit; this being the first survey of this kind for this purpose that has ever been attempted.

The results of this investigation have been filed and correlated, so that the exact meaning of the figures sent in by any state can be accurately interpreted in making the tabulations.

The terms "transfer" or "re-registration," for instance, have a different meaning in various cases. In some states it is necessary to subtract from the figure given as "total vehicles registered" the figures for "transfers" if the exact number of cars in use in the state is to be determined. In other cases, to make this subtraction would render the figures incorrect. AUTOMOTIVE INDUSTRIES is able, as a result of this investigation, to interpret the figures of each individual state in terms of the practice of that state, thus making the figures accurate in the final tables. Another difficulty is to learn the actual number of cars in use in the country on any single date, since the registration year of the various states does not coincide; that is, there is no single date upon which the registration figures of every state have reached their highest point. A majority of the state registration years end on Dec. 31, however, and consequently that offers the best time for the making of a compilation.

The figures for Minnesota and for the District of Columbia need to be explained. In Minnesota the registration year and the fiscal year ends July 1. Up to July 1, 1920, Minnesota had a three-year, instead of a one-year, registration period. The total of registration simply grew over a period of three years, so that the Minnesota total last year was the result of two and one-half years' growth. The figures given in these tables comprise the number of registrations as of Dec. 31, 1920, and have been growing only since July 1, 1920, a six months' period.

This explains the apparent drop in registrations suffered in Minnesota; it is merely an apparent or "statistical" drop, however, and does not in any sense indicate that the actual number of cars in that state has decreased. The Minnesota law has been changed, however, and the registrations for future years should indicate more truly the actual number of vehicles in that state.

The fiscal year for the District of Columbia ends July 1, as well, and the figures given are for a six months' period. Consequently they are naturally smaller than the mid-year figures. It is impossible, however, to explain exactly the difficulties in the District of Columbia statistics, since the whole registration matter is in an exceedingly confused state. It is sufficient to note, however, that no special significance should be attached to apparently radical jumps or falls in the registration figures for the District of Columbia.

A table showing the number of states which register tractors and trailers and the number of these vehicles in each state is being prepared, but complete data are not available immediately. A comparative table of motorcycle registrations for the last three years will also be presented in the Statistical Number.

A CORRESPONDENT of *Der Motorwagen*, who visited the recent automobile show in Copenhagen, noted the following prices for cars of different size, quality and nationality: A Ford car with electric light and starter, 5600 crowns (one crown has a nominal value of 27 cents); a small German Wanderer, 7000 crowns; a French Citroen four passenger car with electric equipment and a piston displacement of about 95 cu. in., 10,500 crowns; a British Calthorpe of the same size, 14,000 crowns; a German Opel of the same size, but without electrical equipment, 9000 crowns; an 8-25 Fiat with electrical equipment, 30,000 crowns, and a 10-30 Mercedes limousine, 32,000

The above prices are in part the result of the remittance embargo on all luxury articles which has been in force in Denmark for some time. No automobiles can be imported at present and the prices asked are controlled more by the pressure of the demand than by factory prices.

Motor Vehicle Registration 1912 to 1920

	1912	1913	1914	1915	1916	1917	1918	1919	1920
Alabama	3,385	5,435	8,078	11,925	21,636	32,873	46,171	58,898	74,637
Arizona	1,624	3,098	5,040	7,318	12,124	19,890	23,905	28,979	34,559
Arkansas	2,250	3,000	5,642	8,021	15,000	28,693	41,458	49,450	59,082
California	88,699	60,000	123,516	163,795	232,440	306,916	364,800	477,450	568,892
Colorado	8,950	13,135	17,756	27,568	43,296	66,850	83,630	104,865	128,951
Connecticut	24,101	27,189	33,009	43,985	61,855	85,724	92,605	109,651	119,134
Delaware	1,732	2,350	3,050	4,657	7,102	10,700	12,955	16,152	18,300
Dist. of Col.	1,732	2,373	4,833	8,009	13,118	15,493	30,490	35,400	9,712
Florida	1,749	2,372	3,368	10,850	20,718	27,000	54,186	55,400	*57,000
Georgia	19,120	18,500	20,916	25,671	47,579	70,357	99,800	127,326	144,422
Idaho	2,500	2,173	3,346	7,071	12,999	24,731	323,289	42,220	50,750
Illinois	68,073	94,656	131,140	180,832	248,429	340,292	389,620	478,438	568,755
Indiana	54,334	47,000	66,400	96,915	139,317	192,192	227,160	277,255	332,707
Iowa	47,188	75,098	112,134	152,134	198,602	254,317	278,313	363,857	437,300
Kansas	22,000	34,366	49,374	72,520	112,122	159,343	189,163	227,752	265,396
Kentucky	5,147	7,210	11,746	19,500	31,700	47,416	65,870	90,641	112,685
Louisiana	7,000	7,200	12,000	11,380	17,000	28,394	40,000	51,000	66,000
Maine	7,743	10,570	15,700	21,545	30,972	41,499	40,372	53,425	62,907
Maryland	10,487	14,254	20,213	31,047	44,245	60,943	74,666	95,634	*105,000
Massachusetts	50,132	62,660	77,246	102,633	136,809	174,274	193,497	247,183	304,631
Michigan	39,579	54,366	76,389	114,845	160,052	247,006	262,125	325,813	412,717
Minnesota	29,000	37,800	67,862	93,269	46,000	54,009	204,458	259,743	64,312
Mississippi	2,895	3,000	5,694	9,669	25,000	36,600	48,400	45,030	64,000
Missouri	24,379	38,140	54,468	76,462	103,587	147,528	188,040	244,363	295,817
Montana	2,000	5,686	10,172	14,499	24,440	42,696	51,037	59,325	60,646
Nebraska	33,861	25,617	40,929	59,140	100,534	148,101	175,409	192,000	223,000
Nevada	900	1,131	1,487	2,009	4,919	7,160	8,159	9,305	10,464
New Hampshire	5,764	7,420	9,571	13,449	17,508	22,267	24,817	31,625	34,680
New Jersey	43,056	48,892	60,247	78,232	104,341	134,964	155,519	190,873	226,459
New Mexico	911	1,721	2,945	5,100	8,228	8,457	15,000	18,077	22,109
New York	107,262	134,405	169,966	234,032	317,866	411,567	463,758	571,662	651,796
North Carolina	6,178	10,000	14,677	21,000	33,904	55,950	72,313	109,017	140,860
North Dakota	8,997	13,075	15,701	24,908	40,446	62,993	71,627	82,885	90,840
Ohio	63,066	86,054	122,504	181,332	252,431	346,772	412,775	511,031	616,800
Oklahoma	6,524	7,934	13,500	25,032	52,718	100,199	121,500	144,500	204,300
Oregon	10,165	13,957	16,447	23,585	33,917	48,632	63,324	83,332	103,790
Pennsylvania	59,357	76,178	112,854	160,137	230,578	325,153	394,186	482,117	570,164
Rhode Island	8,565	10,294	12,331	16,362	21,406	37,046	36,218	44,833	50,375
South Carolina	10,000	11,500	14,500	15,000	19,000	39,527	55,492	70,143	92,819
South Dakota	14,481	14,578	20,929	28,784	44,271	67,158	90,521	104,628	122,000
Tennessee	35,187	54,362	19,769	7,618	30,000	48,000	63,000	80,422	101,852
Texas	35,187	54,362	64,732	90,000	197,687	213,334	251,118	331,310	427,634
Utah	2,576	4,021	2,253	9,177	13,507	24,076	32,273	35,236	42,664
Vermont	4,283	5,918	8,256	11,499	15,671	20,369	22,655	26,807	31,625
Virginia	5,760	9,022	14,002	21,357	35,426	55,000	72,228	94,120	134,000
Washington	13,990	24,178	30,253	38,823	60,734	91,337	117,278	148,775	*175,000
W. Virginia	5,349	5,088	6,159	13,279	20,571	31,300	38,750	50,203	78,362
Wisconsin	24,578	34,646	53,161	79,791	115,637	164,531	196,844	236,981	293,298
Wyoming	1,300	1,584	2,428	3,976	7,125	12,523	16,200	21,371	23,926
Totals	1,033,096	1,287,558	1,768,720	2,479,742	3,584,567	4,992,152	6,105,974	7,596,503	8,887,572

*Estimated.

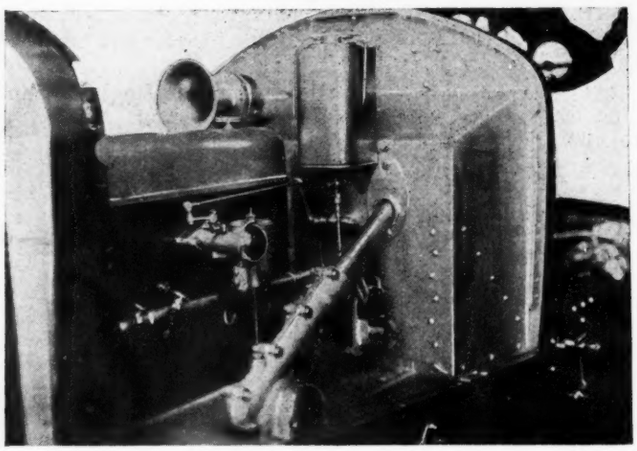
Belgian Show Includes New Cars With Many Previously Exhibited

Newer chassis are mostly equipped with eight or four cylinder engines having overhead camshafts, separate heads and block castings which serve to enclose the vertical shaft drive. Aluminum webs and dash form separate engine compartment on some expensive chassis. Many novelties and refinements in spring suspensions, braking systems and steering gears.

By W. F. Bradley

BELGIUM possesses less than a dozen automobile factories employing about 8,000 men (with another 7,000 in body and accessory works and forges), hence an invitation had to be sent to foreign manufacturers in order to fill her first post-war automobile show. The exhibition was held in the Palais du Cinquantenaire from Dec. 10 to 19, and was officially visited by the King. It was supported by every Belgian manufacturer, but these were outnumbered by foreign makers. France had the biggest share in the show, with 75 exhibitors of passenger cars; America had 14 car makers, Belgium 10, Italy 6, Great Britain 4, and Holland and Switzerland one each. In addition to passenger cars, the show comprised truck, tractor, body and accessory sections, with a total of 309 exhibitors. This constituted a record, for at the last show, held just before the war, there were not more than 200 exhibitors.

Since the French show of a year ago there have not been many changes in design, and inasmuch as most of the leading continental manufacturers were represented at the recent Olympic show, it was not to be expected that very much in the way of novelties and new refinements would be found on other than Belgian exhibits.



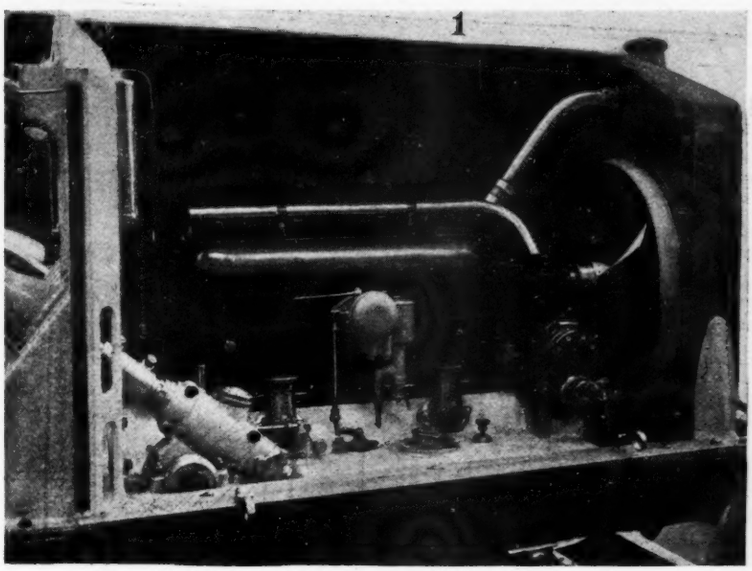
Beck overhead valve engine

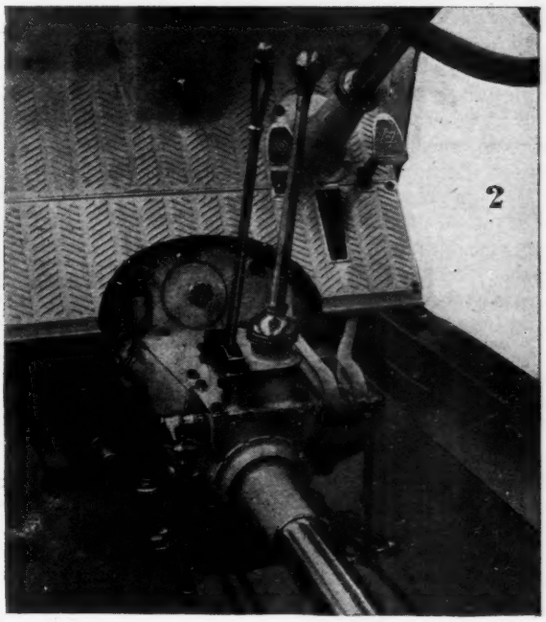
The spirit of enterprise and determination shown by the Belgian people in getting back to work is remarkable in view of the fact that no special protection has been afforded. Unlike any other country in Europe, Belgium has the same import duties as before the war, with the result that foreign competitors have been able to step in and secure an important place in her market. The greatest change since pre-war days is in the importation of American cars. Before the war these were practically unknown in Belgium, whereas at the present time at least 20 makes are selling in this market. America has created this position for herself despite very adverse rates of exchange. She had in her favor, however, the ability to make deliveries at a time when other nations were not producing.

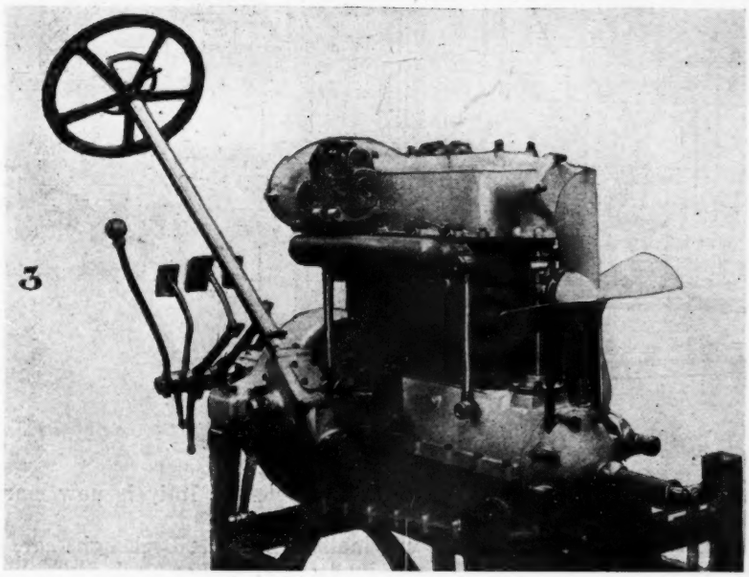
The position of France on the Belgian market has not undergone any appreciable change. Exchange is slightly in favor of the French manufacturer, but it is only during the last six months—or since the depression set in—that he has been in a position to export. England has not changed her position in this market, and does not do a great volume of business. Her motor bicycles and motor accessories seem to be more appreciated than her cars.

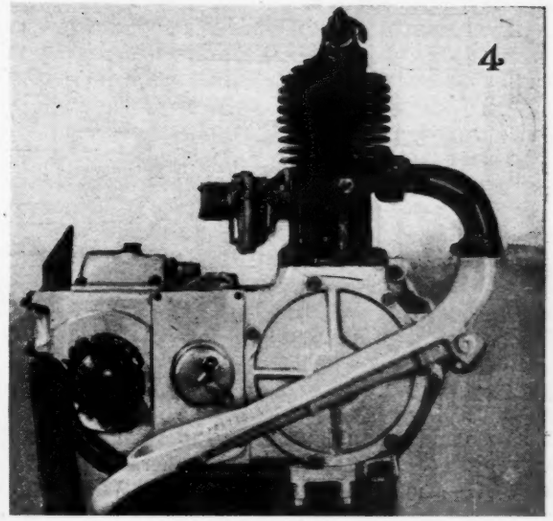
Outside the Belgian exhibits the only entirely new cars at the Brussels show were the Italian Ansaldo; the French Fonck and the Beck. Lorraine-Dietrich showed the latest type of light six cylinder. Renault has made some changes on his six cylinder. Instead of underslung semi-elliptic springs, this car now has cantilevers, placed diagonally in the frame and, instead of being shackled, having their ends carried in rollers. Another change in this model is in the radiator, which instead of going right across the frame, behind the engine, now has its vertical tubes only to left and right of the last cylinder.

The Fonck is an entirely new production, established by the well-known French aviator, with the assistance of a former Hispano-Suiza engineer and the backing of the Jacob Holtzer Steel Company. Two cars are to be produced, a four and an eight-in-line, of the same general design but with the difference that the eight will have brakes on all four wheels and the four the usual brakes on transmission and rear wheels. Only the complete chassis of the four found a place in the Brussels show, the eight being limited to the engine and gearbox. This job is very high-class throughout, and is laid out as a well finished, lively, sporting model. Although the cylinders are only 3.1 by 5.1 in., it is claimed that the four cylinder model will attain a speed upward of 60 m.p.h. with a four passenger touring body. Modern design tends to keep weight down, but the frame members are heavy and very much deeper than would be considered necessary by an American designer. Evidently the engineer has sought, by adopting this deep section, to avoid the troubles of sagging frames and misalignment which have developed in some sporting cars when driven hard over French roads.







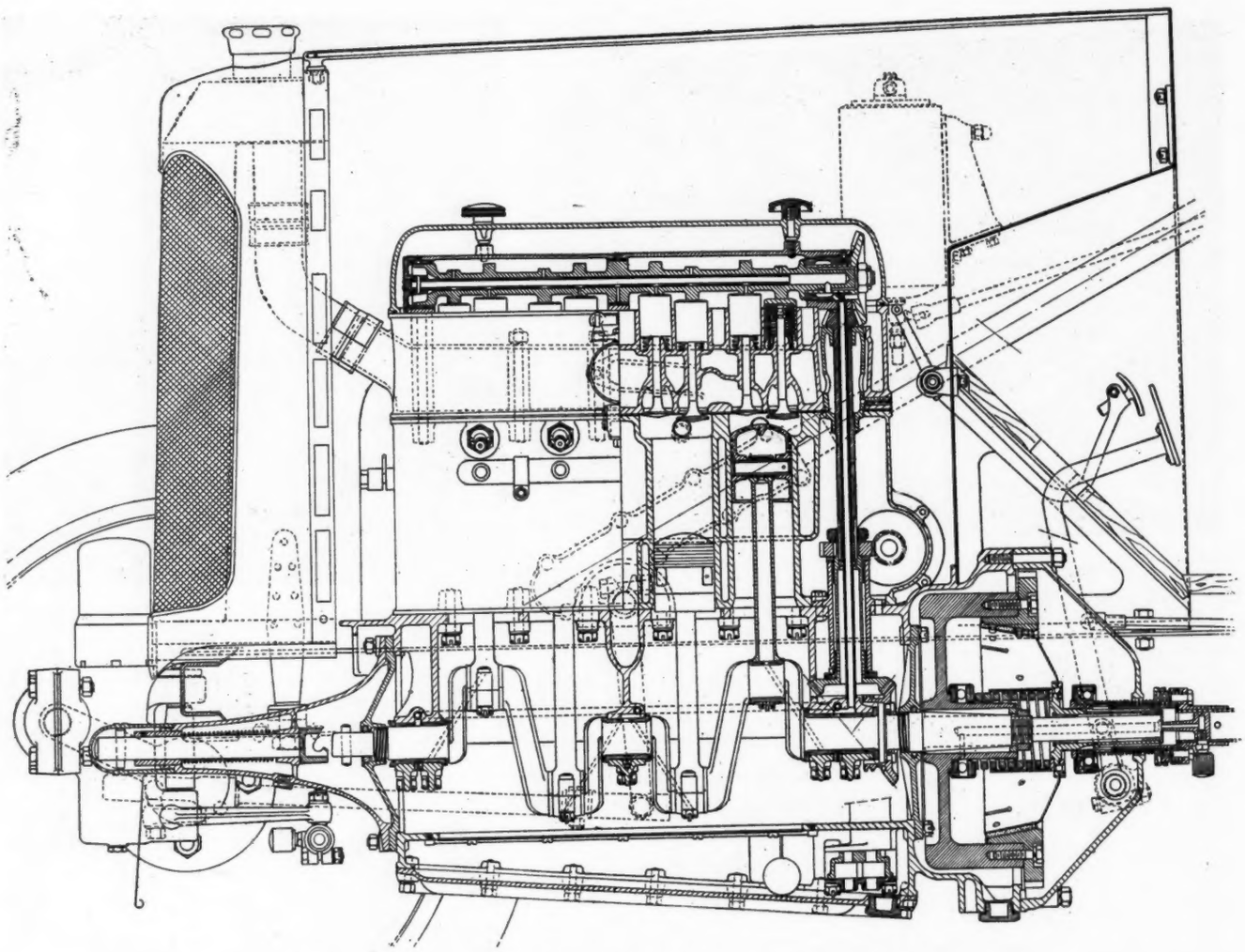


1—*Carbureter side Metallurgique engine.* 2—*Metallurgique gearbox with left-hand control.* 3—*D'Aoust three-litre semi-racing type engine.* 4—*Ballot two-stroke motorcycle engine and transmission*

The cylinder block is so compact that it does not give the impression of having five main bearings for the crankshaft. A detachable head is used. It carries the eight vertical valves and the overhead camshaft. A central drive is employed for the camshaft, by the use of helical gears, the vertical shaft being inside the cylinder casting. There is a double housing for the camshaft; the inner one carrying the camshaft and being perfectly oiltight. The outer one which covers the whole of the valve operating mechanism, really serves only to add to the finished appearance of the engine as a whole. At the base of the vertical shaft driving the camshaft, there is a cross shaft which on one side drives the magneto and the generator and on the other side operates the water pump. The magneto and generator are placed parallel to the cylinders. A double distributer, delivering current to eight plugs placed horizontally on opposite sides of the engine is used. For the eight cylinder model the arrangement is not quite the same, for instead of the water pump being driven directly off the end of the cross shaft it is placed with axis parallel to the cylinders and in tandem with a second magneto. Aluminum alloy pistons are used and connecting rods are I-section forgings.

The unit powerplant of the Fonck models has three point suspension. Left hand steering and right hand control are employed, the change speed and brake levers being directly on top of the gear-box. The whole of the space between the engine and the frame members is covered in with cast aluminum plates. The aluminum dash comes right down to the engine base chamber and is bolted to it. All the air has to escape through the louvres in the side of the hood or through the wire gauze in the lower portion of the aluminum dash, and the only opening under the hood is for the fan belt, which is driven off the crankshaft. The steering gear passes through the dash, but without leaving any gap. The shaft carrying carbureter and ignition control levers is covered by an aluminum housing. The radiator is cowled, and the whole of the aluminum work is polished so as to make it as easy as possible to keep the engine clean. The aluminum instrument board has two tubular supports which slide into sockets cast with the aluminum dash, thus making it possible to adjust the instrument board to any desired position to suit the bodywork.

One of the features of the Fonck is the use of semi-elliptic springs which have their greatest width, 4.7 in., at



Longitudinal section, Beck overhead valve motor at Brussels show

the axle and gradually decrease to a width of 2.3 in. at the extremities. The springs are underslung, have no clips, and take the drive and the torque. With this arrangement, two universal joints are required. The propeller shaft is tubular and of large diameter. The wheelbase of this chassis is 122 in., but with the compact engine the available length for the body is 103 in. The eight cylinder has a wheelbase of 142 in.

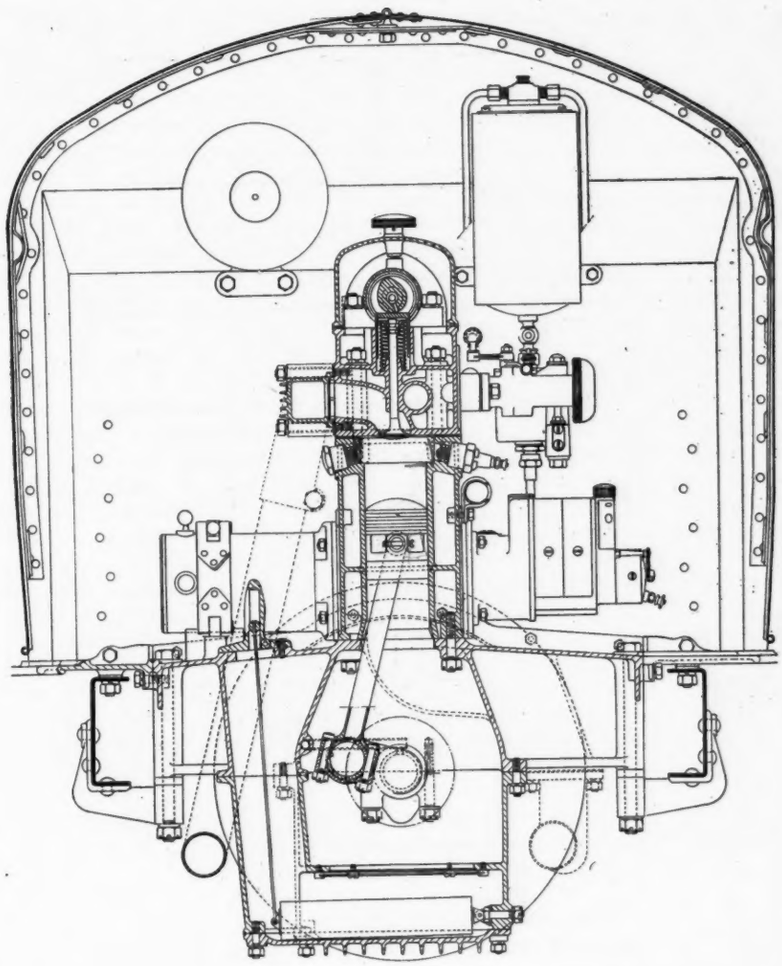
The Italian Ansaldo Car

Ansaldo, the largest general engineering firm in Italy, has entered the automobile field with what is considered in Europe a medium, general service, economical automobile. This is a class of car which has no counterpart in America, for it is smaller and better finished than the Dodge type. The four cylinders of the Ansaldo measure 2.7 by 4.7 in., are a single casting with the upper portion of the base-chamber and have a detachable head with overhead camshaft. The vertical drive shaft is within the cylinder casting. The water pump housing is cast with the cylinders, and is driven by the cross shaft which also operates the magneto. The engine has three point attachment to the frame and is a unit with the clutch and gearbox, the latter having only three speeds, instead of the four commonly employed on a car of this type in Europe. It is rather unusual, from the Italian standpoint, to find that Hotchkiss drive is employed. Detachable wood wheels are also an unusual feature, for Italian makers show a strong preference for metal.

It is understood that this car was designed to be produced at 7,000 lires, but the price in Italy is now more than 30,000 lires.

There is a lot of original work in the Beck light car, a small four cylinder (2.5 by 4.4 in.). It has block cast cylinders with detachable head and overhead camshaft driven by a vertical shaft and bevel gearing from the rear. By this arrangement the electric generator and the magneto are placed at the rear, but there is no loss of accessibility, for the distributer end of the magneto is outwards, directly under the steering column. Valve operation is direct, without the use of followers. A piston type head is screwed into the extremity of the valve stem to give adjustment. It is guided in the camshaft housing so as to provide for the thrust occasioned by the directly operating cam. Beck has adopted the plan, which up to the present has been confined to makers of costly cars, of extending the crankcase webs up to the frame members and bringing the cast aluminum dash down to the engine, so as to make a completely enclosed compartment. By this arrangement all the hot air from the engine has to escape through the sides of the hood.

Another peculiarity of this car is the method of uniting gearbox and differential housing, carrying the load on a tubular axle, and driving by transverse shafts with universal joints. Coil springs are used all around for suspension, in place of laminated springs. All four are enclosed in dust-proof and oil-tight housings, and the coils are of variable thickness, increasing in section as the center is reached. This gives a suspension which in a certain degree automatically adjusts itself to the load. One

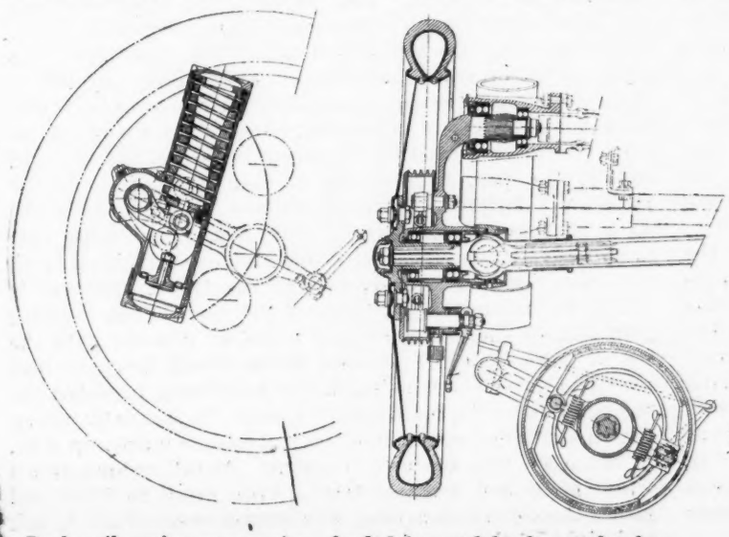


Transverse section, Beck four-cylinder overhead valve motor at Brussels show

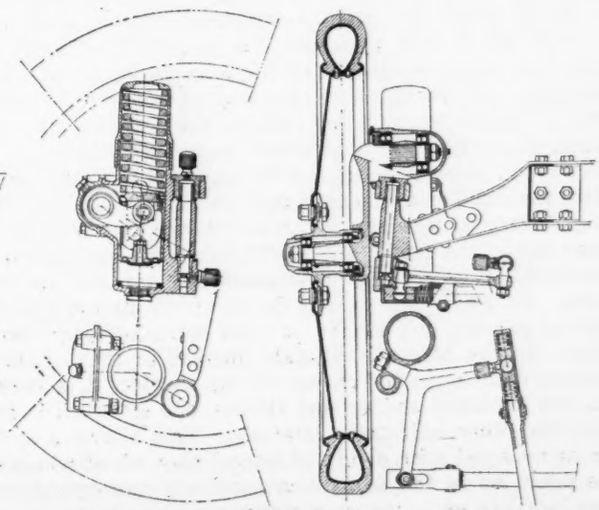
of the mechanical features of the car is the entire absence of keys and keyways, all shaft fittings being tapered and splined.

Among the Belgian makes one of the most distinctive cars is the new Excelsior, a high-class six 3.3 by 5.5. in. The engine is an L-head type in one casting, with a counterweighted crankshaft carried in four bearings and machined entirely out of the solid. Excelsior maintains that for a high class job the results justify the extra cost compared with a forged shaft. There is a flexible connection between engine flywheel and a clutch member. Heavy rubber rings, about six in number, are recessed in the rear face of the flywheel, and these receive studs on the forward face of the clutch member. The rubber rings are set up with graphite and, it is declared, there is no tendency for them to harden under this service. The dominating feature of this chassis, however, is the system of braking on all wheels, together with the cantilever suspension and attachment of the rear axle to the frame. The four wheel brakes are the design of Engineer De Coninck and were worked out during the four years the Germans had forcible possession of his factory. Excelsior brakes diagonally by means of cables; one cable being brought from the right front wheel over a double lever on the brake pedal shaft and thence to the left rear wheel. In this way the effort applied to opposite wheels is always equal, and even if one cable should break, two wheels on opposite sides would hold and the car would not deviate from its straight course. Merely for holding the car when in a stationary position, there is a second control to the rear wheels by lever.

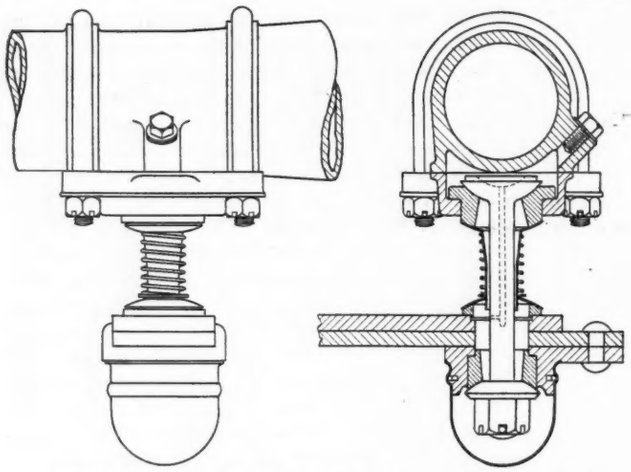
At the front the brake camshaft is received in the lower portion of the axle and passes direct into the brake drum, so that there are no universal joints on this braking system. The four main brake levers with yoked ends are telescopic, so that when dismounting it is not necessary to touch the yokes but merely knock out a pin and pull the two telescopic parts apart. Another unusual feature, which it is declared has given excellent results, is the use of alternating sections of cast iron and fabric for brake lining. It is found that this stops the screaming common with metal to metal shoes, and that the fabric is rendered more efficient as it becomes impregnated with iron dust. The hardened steel face plates on the brake shoes, which come in contact with the brake cam, are double wedges with notches giving one millimeter adjustments. Finally, the brake shoes are slightly eccentric. It is claimed that with perfectly concentric shoes only a line contact is obtained, whereas if made slightly eccentric the slight spring which sets up



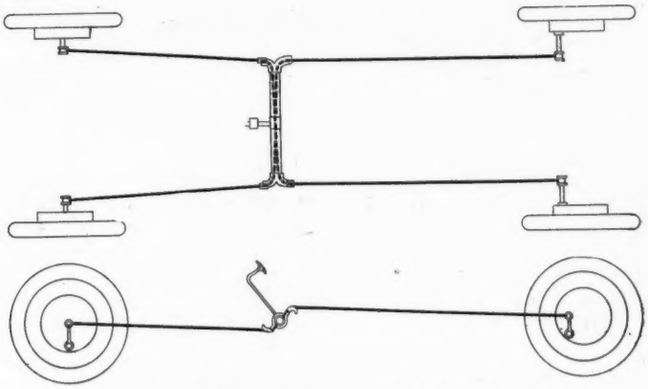
Beck coil spring suspension, final drive and brake mechanism



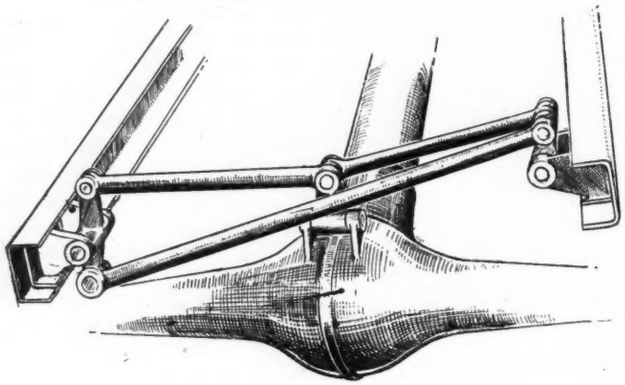
Beck coil spring suspension and steering pivot



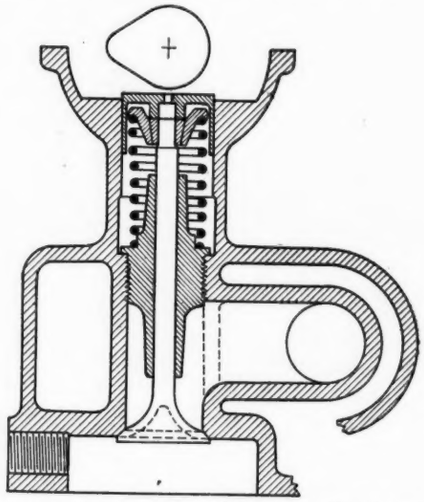
Excelsior car, showing ball and socket attachment of cantilever spring to axle housing



Four-wheel braking system on Belgian Excelsior



Compensator on Belgian Excelsior



Miesse overhead valve with guide for follower

in the shoes assures the entire surface being made use of for braking.

The cantilever springs on the Excelsior are not rigidly fastened to the axle housing, but are secured by a short connecting rod with ball and socket at each end, the whole of the mechanism being enclosed and fed with oil from a reservoir containing a six months' supply. By this attachment the axle is free in relation to the main frame members, but in conjunction with this flexible attachment, use is made of a compensating stabilizer consisting of two connecting rods from the upper portion of the differential housing to links on the inside of the main frame members, the whole forming a parallelogram, as shown in the illustrations. This device leaves the axle free to move in a vertical plane, but eliminates all lateral movement, the practical result being that all the advantages of cantilever springing are obtained without any tendency for the rear end of the car to roll when running fast. Tests show that when taking turns at high speed the rear wheels track perfectly and show none of the tendency to skid so common with the usual attachment of cantilevers.

It has been necessary, with this device, to stiffen up the rear end of the frame and to obtain a very substantial attachment, but the results obtained are remarkably satisfactory. All the bolts used with the stabilizer, as well as every spring shackle bolt on the car, are adjustable for lateral play. In the case of a shackle, instead of the bolt being passed directly in the cheeks of the shackle, it is carried in two hardened and ground sleeves, one of which is fixed and the other adjustable laterally. This allows a spring to be mounted with plenty of lateral play, all of which can be taken up in the adjustment, and any subsequent wear can be taken up in the same manner.

Metallurgique, while maintaining two smaller types, has produced an entirely new chassis with a four cylinder 3.9 by 6.29 in. engine. It is understood that this engine will be replaced, at a later date, by a six-cylinder of the same bore and stroke, mounted in the same chassis. Features of this new product, which is a really high class job, are unit construction of engine and gearbox, with centre control; brakes on all four wheels; cast aluminum dash and floor boards; a new forged full floating rear axle; and underslung semi-elliptic springs of exceptional length. Probably these are the longest springs ever fitted to a car—70 in. long and 2.7 in. wide. They are mounted under the axle and placed directly under the main frame members.

The growing practice of extending the crankcase webs right up to the main frame members has been adopted by Metallurgique. The cast aluminum dash, however, is not extended down to the engine but slopes away rearwards so as to form the toeboards. A recess is cast in the forward face of the dash to carry the vacuum feed tank, and the polished aluminum instrument board is secured to the dash by tubular steel arms. This method of using cast aluminum for dash and toe boards and also for filling in all the space between the engine and the frame members is one of the refinement features of the show. The steering gear box of the Metallurgique is bolted directly onto the top of the extended crankcase webs, a well being formed here to receive the housing, and a hole being provided for the passage of the main steering arm. It is worth noting that the oil filler on the steering box has a hinged cap, 3 in. in diameter, held down by a spring. Metallurgique drives water pump and magneto from a cross shaft in front and places the electric generator and starter respectively to left and right of the gear box.

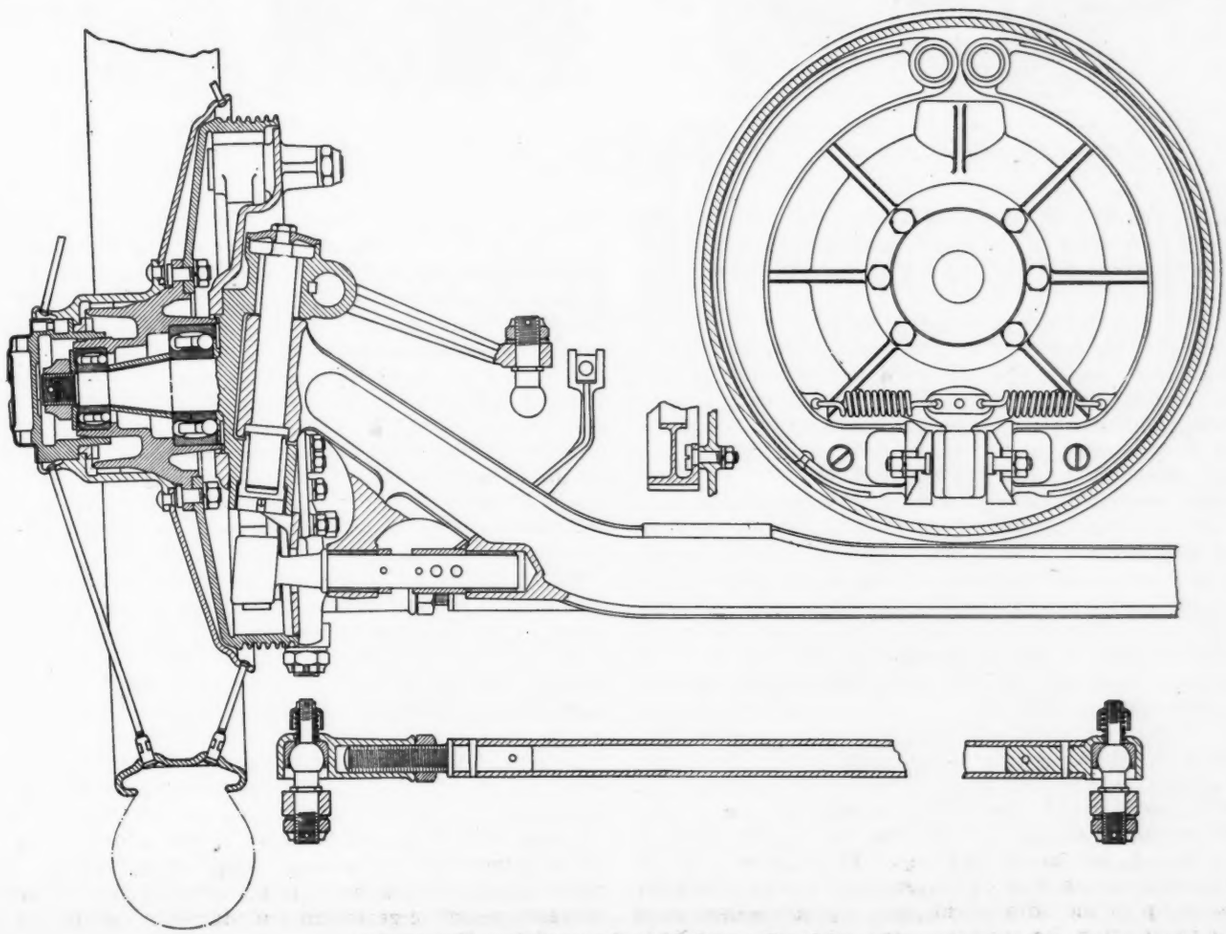
Brakes on all four wheels are of the Isotta-Fraschini type, with the brake camshaft for the front wheel carried in bushings in the axle. This is in contrast to the Perrot system, under which the cam shaft is at the highest point and is supported in a bearing on the frame member. This, of course, necessitates a telescopic shaft with a universal joint. Steel ribbons are made use of on this car for brake control, but instead of placing these horizontally, and passing them through fibre rollers or other support, as is usual to prevent whip, they are placed vertically. In connection with the brakes, it should be noted that front and rear ribbed drums are of the same diameter, but the rear ones are twice the width of those on the front wheels, and carry an extra pair of shoes, which are operated by lever. This makes it possible to comply with the necessity for locking the brake when the car is standing on a hill.

Other front wheel braking systems seen at the show were Hispano-Suiza, Delage and Talbot-Darracq, all built on the Perrot license; the Bellanger, which has its steering pivots inside the brake drums, the Isotta-Fraschini, and the Excelsior. Other firms announcing front wheel brakes but not showing them on their chassis were Fonck, Spa, D'Aoust and Miesse. Some half dozen other Continental firms are known to be negotiating for Perrot licenses, but they have not yet made public announcements.

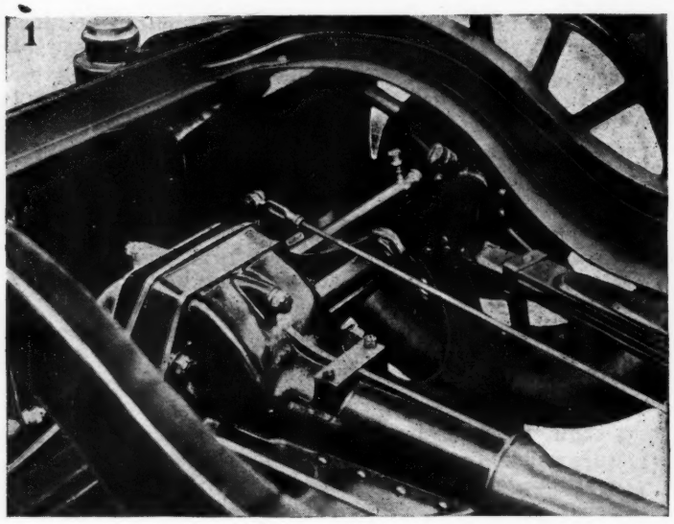
Miesse, one of the oldest of the Belgian firms, has two new engines, with respectively four and eight cylinders, of the same general design and the same bore and stroke. It is a growing practice, when adopting an eight-in-line engine, to make a four at the same time and of the same size. Miesse dimensions are 2.7 by 5.1 in., and for each type the cylinders are a block casting with detachable head and overhead camshaft, driven by a vertical shaft and bevel gearing inside the cylinder casting. The show models have aluminum cylinders with liners, but it is declared that these will be abandoned for cast iron. In common with several others at the Brussels show, Miesse does not use a pivoted follower between cam and valve, but has a nut screwed on the end of the valve stem, and mounted on this a piston-type hardened and ground cap, which is well guided in the detachable head. This eliminates the thrust and consequent wear occuring when the plate is screwed directly into the valve stem.

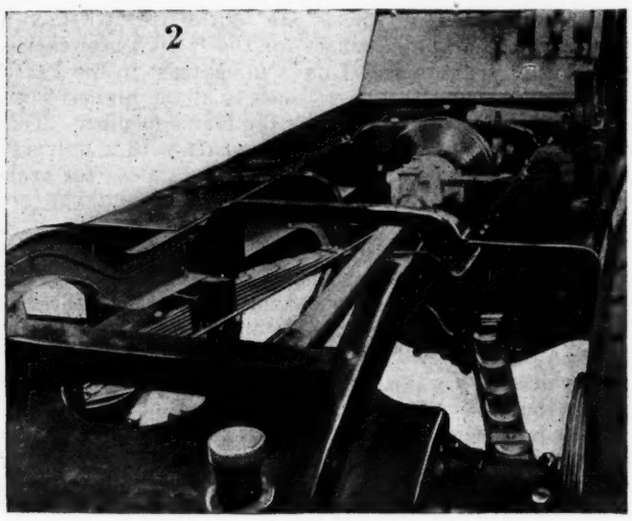
Miesse drives the two blade fan from the vertical shaft, with a friction clutch interposed. A rather unusual feature is that the steering gear housing is cast with the engine base chamber, being placed on the right hand forward arm, just below the magneto driven from the cross shaft. The complete chassis of this new type was not ready for the show, but according to information obtained its chief feature will be front wheel brakes with hydraulic operation.

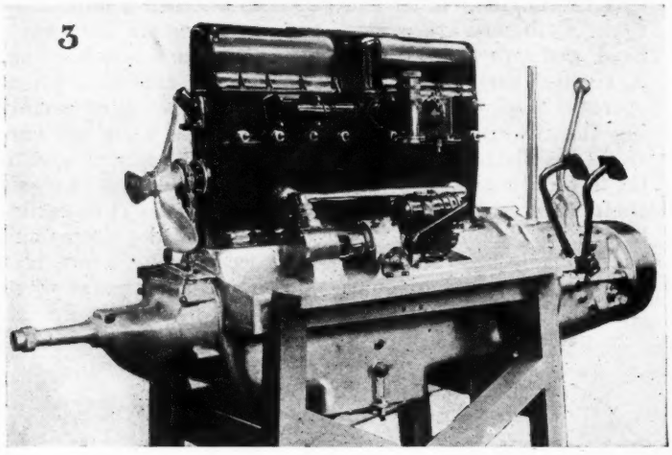
A semi-racing type 3-litre engine is the feature of the D'Aoust production. This car was not shown complete, only the engine, clutch and gearbox unit being on exhibition. Cylinders are a block iron casting with detachable head, and an overhead camshaft in an aluminum housing. A vertical shaft at the front drives the camshaft which operates three valves per cylinder. The method of mounting the two magnetos is rather unusual. They are carried on a platform cast with the camshaft housing and to the left and right of it, each magneto being driven by silent chain from the rear end of the camshaft. This design brings the magnetos to the highest part of the engine and has probably been adopted for the accessibility it provides and the possibility of quick change and adjustment when racing. This engine is built to the designs of a French

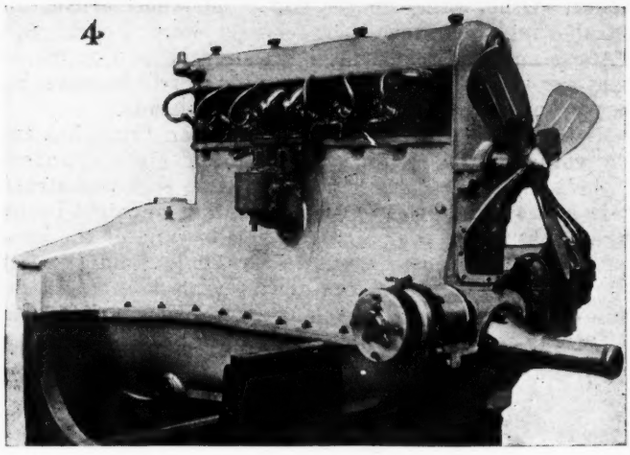


Front axle and front wheel brake on Excelsior car









1—Renault reinforced rear axle and cantilever springs. 2—Renault diagonally placed cantilever springs.
3—Fonck eight-cylinder engine. 4—Spa new six-cylinder engine which is all aluminum with the exception of detachable head

specialist, and will, it is declared, be entered in the leading 183 cubic inch races of the year. In addition to this special sporting type D'Aoust has a medium size car on quite standard lines.

Minerva, the biggest producer in Belgium, shows nothing new, for this firm had its post-war models out for the Paris show of a year ago, and exhibited the same at the recent London show. There are two models, with Knight engines of four and six cylinders, respectively.

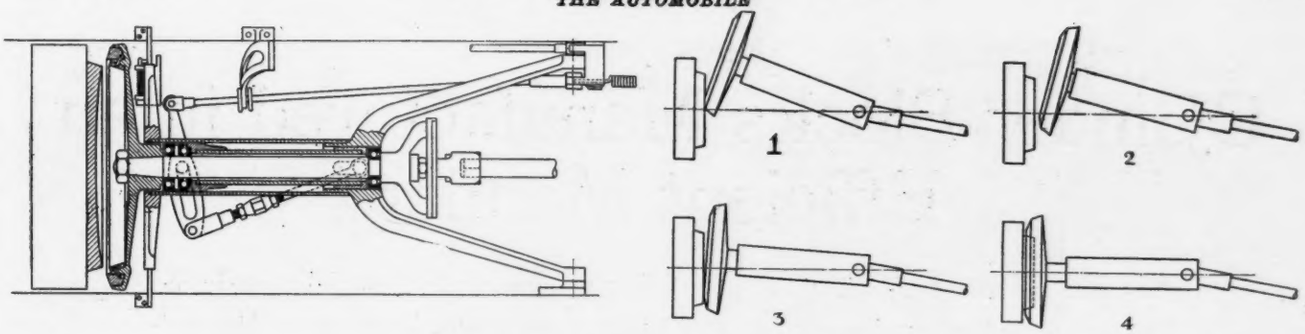
The F. N. Company exhibited a new model which also was uncovered at the recent London show.

Belgian makers generally are paying more attention to high class, almost luxury types, than to popular models. There is no firm with a program similar to that of Citroen in France or Bean in England. Somua has a popular type, but the firm does not have big production means. Practically the only other firm attempting to get into the popular class is Belga, a concern established since the war and marketing a light car with an unusual and interesting type of friction transmission.

The engine is a Ballot of 2.5 by 4.7 in. bore and stroke, carried on a subframe, and the rear axle is a standard type, with Hotchkiss drive. In place of the usual gearbox there is a friction transmission. When driving on top a cone clutch is in engagement and the drive is straight through to the rear axle. The driven member of the cone clutch has two friction surfaces; the cone used for normal driving on top gear, and a ring of canvas and rubber mounted on the forward face of this disc. When the cone has been disengaged, the driven member of the clutch is inclined so as to bring the ring in contact with the driving member, and the lower the gear ratio required the greater the inclination, until dead center of the driving member is reached. Reverse is obtained by taking the plate past dead center. The necessary inclination is provided for by carrying the clutch shaft in a yoke pivoted to the subframe. The clutch is used in the usual way, and changes of ratio are obtained by a straight movement of the lever. It is claimed that this device has been on the road for a year and has given perfect satisfaction. The direct drive is no departure from standard practice, and if the friction gear has stood up to tests, the Belga ought to become popular, for it is cheap to build and gives a wide range of gear ratios.

Ballot, the French specialist, took advantage of the Brussels show to come forth as a producer of complete power plants. His unit comprises engine, clutch and gearbox ready for fitting to a sub-frame. This firm is now also specializing on motorcycle units of two-stroke engine, clutch and gears in one. House lighting sets also are being produced.

Belgium had a high reputation before the war, for customs bodies, and this has been maintained in the post-war products. Numbers of English chassis are sent across the Channel to be fitted with Belgian bodies, and this accounts for a greater predominance of English types that is seen elsewhere on the Continent. This is particularly noticeable in all weather bodies, which are not much favored by Continental motorists, but are in great demand by English



Friction transmission used on Belga light car

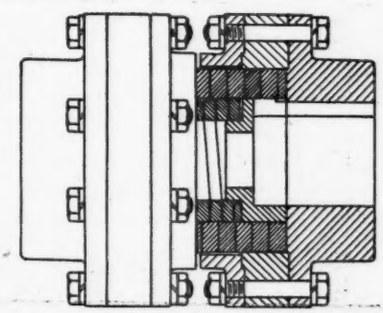
motorists. There is only a mild tendency towards the concealed top, and, speaking generally, it is adopted only for sporting type two and three seaters. The Etablissements Generaux showed some very fine examples of running boards and tool boxes in a single stamping, thus avoiding the sharp angles which are unavoidable when the tool box is a separate construction placed on the running board. This firm showed runningboard, tool box, two fenders and valance in one piece without any visible bolts and screws, giving a very good effect on cars with rounded lines.

The Bosch magneto was seen on two cars, one Belgian, the other Dutch. Bosch, however, did not have a stand. Switzerland came into the field as a magneto producer with the Scintilla. On this instrument the permanent magnet rotates, while the contact breaker, the windings and the condenser are fixed. The distributer is at the driving end of the magneto, thus allowing shorter wires to be used than when placed at the opposite, and outer, end. A feature of the Scintilla is the ease with which it can be dismounted and assembled.

An All-Metal Flexible Universal

A NOVEL type of universal coupling has recently been placed on the market by the Karge-Baker Corporation. The flexible portion of this coupling consists of two coil springs wound in opposite directions, placed concentrically. The ends of each spring is welded to a header attached to the driving and driven flanges or sleeves respectively in the manner shown in the accompanying cut. It is claimed that the drive is carried through the continuous coil, but when under torsional load the coils of the outer spring expand or contract depending upon the direction of turning and grip either the outer casing or the inner spring, thus transmitting torque to the driven member. The particular advantages attributed to the coupling are the cushioning effect of the springs in picking up the load, the fact that no lubrication is required and that the efficiency is high. The design is such that perfect balance is obtained and the permanency and reliability in operation are said to be unquestioned.

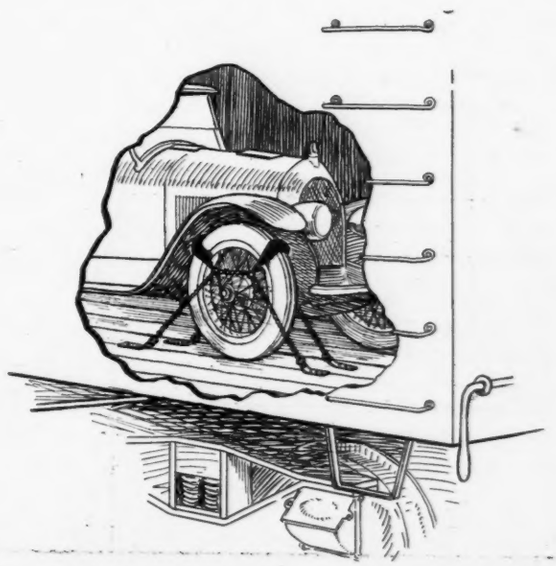
The driving coil is constructed of heat-treated alloy steel, accurately ground to size. The flexible arbor or smaller coil is ground to assemble with accuracy inside the driving coil. The driving coil is so constructed that the thrust caused by forward and backward shaft movements is taken up by the spring. The couplings are designed to allow a maximum driving angle of about 10 deg. or a ⅛ in. offset, and are said to be absolutely noiseless in operation. When picking up the load the driving end of the joint moves about one-tenth of a revolution before the driven end moves. A certificate of tests made by the French Government laboratories show that a Karge coupling having a coil of 52 m.m. dia. and 9 turns transmitted without appreciable power loss from 8 to 24 hp. at speeds of 925 to 1560 r.p.m. respectively when running at an angle of 11 deg.



Sectional drawing of flexible universal coupling

New Device in Use for Shipping Automobiles

A NEW device for fastening an automobile in a railroad freight car consists of a chain tie gripping the wheel and bolted to the floor of the car. This device has recently been placed on the market by the Carbo Steel Products Co. This chain is applied to each wheel of the car, the illustration herewith showing the manner of application. A rope winding around the tire gripping section of the chain protects the tire from abrasion.



Device for fastening automobiles in freight cars

Cylinder Blocks Manufactured in an Efficient Manner

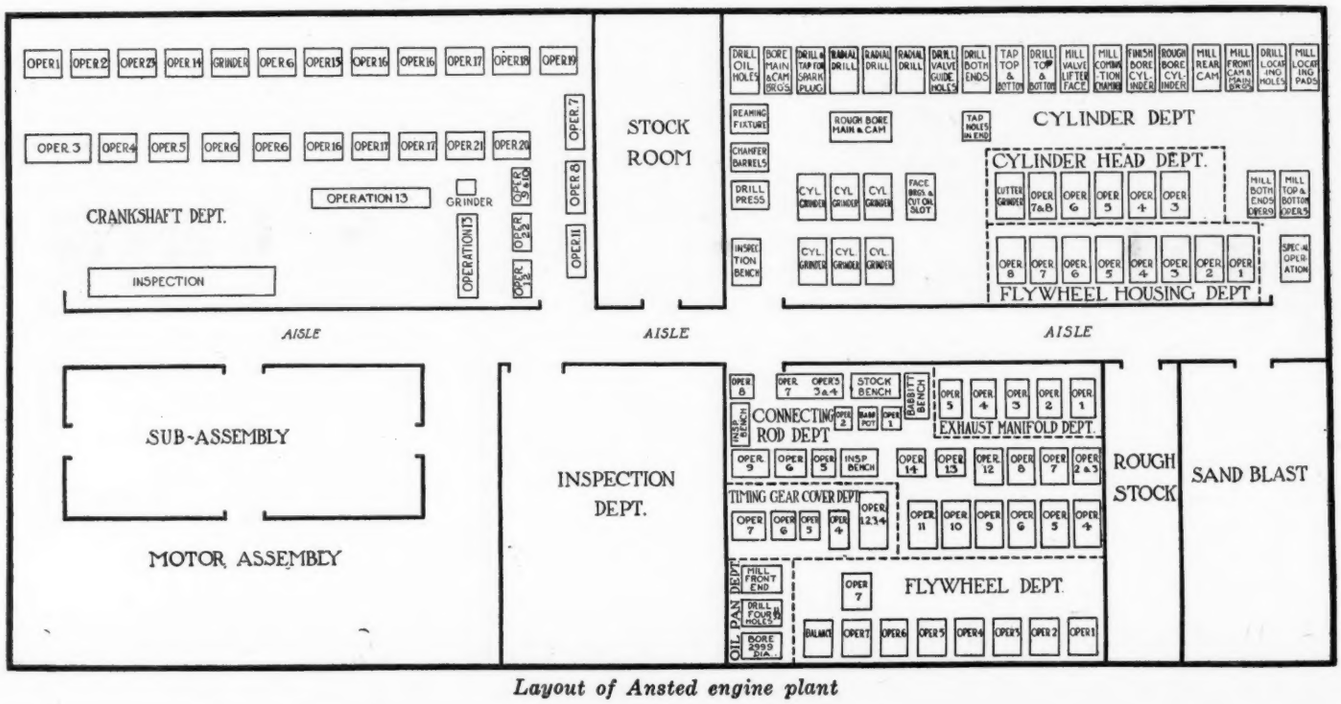
Engines for the Lexington car are being produced in a specially designed factory, which embodies many interesting production features. The following article describes in detail the manufacturing processes used in machining the cylinder block castings for this engine.

By J. Edward Schipper

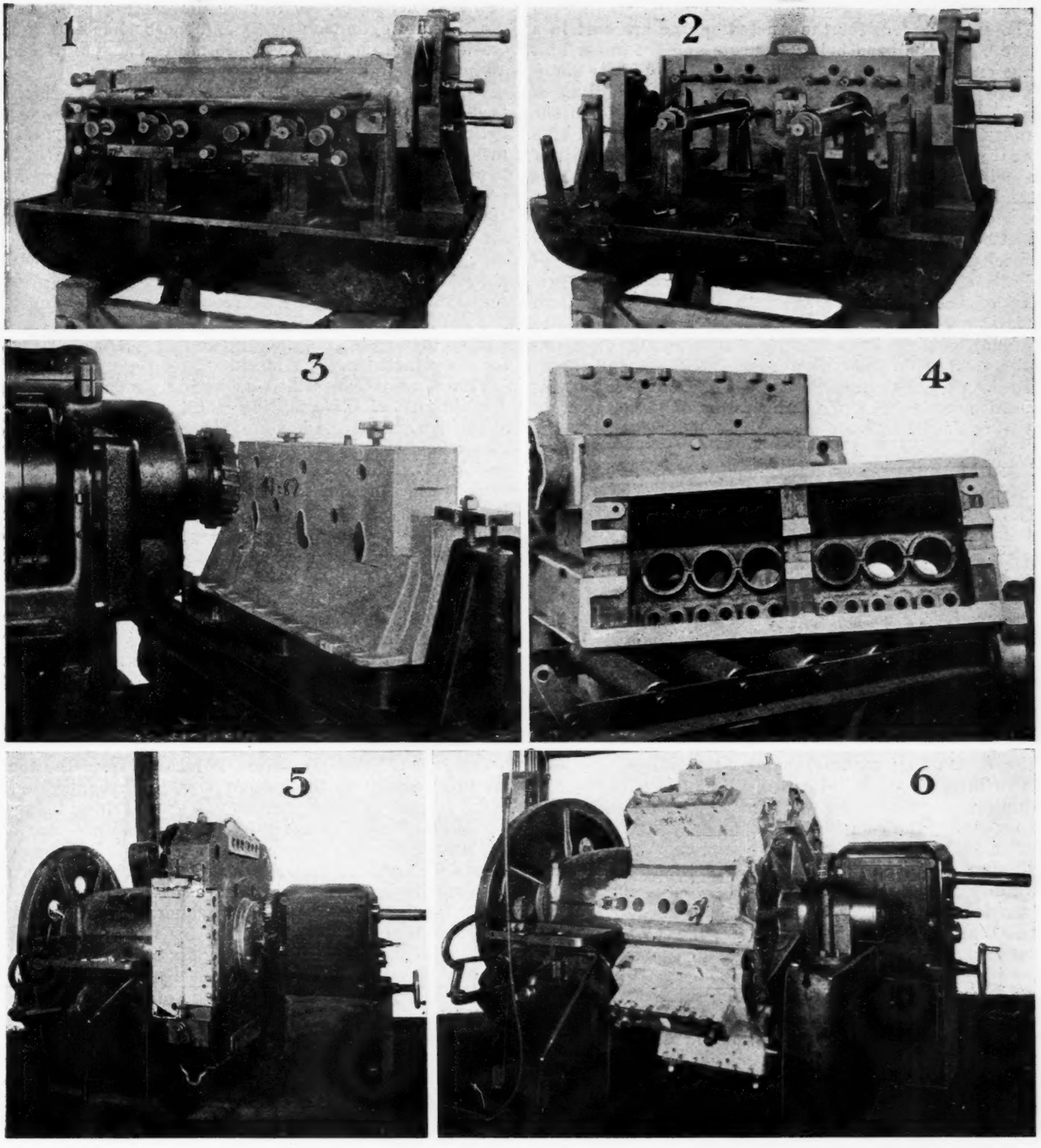
THE production of engines for the new Lexington car is taken care of in a specially designed factory with an output capacity of from 40 to 50 engines per day. The concern producing the engines is the Ansted Engineering Co., which has buildings adjacent to the Lexington factory and, in fact, is very closely allied with it. Inasmuch as this factory has been designed particularly for the production of the Ansted engine, and with an eye toward smooth production up to capacity, it incorporates some very interesting production features which have tended to make it a very efficient plant.

In the general layout the plant is divided into two parts, which may be called production and assembly. These two main parts occupy, roughly speaking, the two ends of the plant, while at the center is the finished stock store-room which acts as a clearing house for all of the material entering the assembly department. The parts which are manufactured in the factory enter this clearing house, as do also the parts which are received from outside sources. The plan of the factory shown herewith indicates this central stock-room and the inspection department from which the parts pass into the stock-room. Both the finished parts received from outside and those manufactured in the plant itself go through the inspection department into the finished stock-room, from which they are drawn for assembly. As there is a railroad siding along the side of the plant, the receiving department gets the material directly from the freight car from which it is passed to the inspection department and into the stock-room with a minimum of movement, as the unloading platform is at the entrance to the inspection department.

This general scheme gives an efficient layout which is backed up by some interesting installations of special machinery for the manufacture of the different parts It is beyond the scope of this article to take up in detail the manufacture of all the parts which enter into the manufacture of the engine, but it will be of interest to select one and follow it through, to show how space has been conserved and efficiency promoted by the use of machinery particularly adapted to the needs of the product and incorporating the latest devices for rapid handling of the parts. To carry out this purpose the cylinder block operation has been chosen as perhaps presenting the greatest manufacturing difficulty and, at the same



Layout of Ansted engine plant



1—A cylinder block in the rough casting inspection jig. When the cylinders are received they are given a quick going over at the finish points with white cold water paint. This inspection jig in a very few minutes will go over each casting thoroughly and scribe the finish line of each important finished surface. This tells conclusively whether the cylinder block will machine. 2—The rough casting inspection jig without any casting in it, giving a good idea of its construction. 3—The first machine operation on the cylinder block. On the rough casting inspection jig and on the fixture for the first machine operation the location is from the cored holes of the cylinder barrels. This is contrary to usual practice and might be regarded as unnecessary, but is done to secure uniform cylinder walls and the balance of the machining on the cylinder block is brought to the barrels so there is no question of squareness on the entire job. This operation mills off the locating bosses on the side of the cylinder block. 4—In addition to the locating bosses there must be other locating points to fix the cylinder block for drilling and boring operations. This locating is done by means of two ½-in. reamed holes in the bottom of the cylinder block. These holes are shown in this print. The operation of drilling them is done by a standard machine and fixture. 5—Milling top and bottom faces on a Davis rapid miller with a rotating table capable of carrying four blocks at a time. 6—End milling a block on a Davis rapid milling machine capable of handling 240 blocks a day because of its continuously rotating table carrying nine blocks

time, involving the necessity for particular machine installations.

The six cylinders for the Ansted engine are cast in a single block, the head being separate and the upper half of the crankcase a unit with the block. Up-to-date methods are utilized from the very start in the handling of this block. As soon as the block is received from the foundry it is submitted to an inspection by means of a special gage which checks the amount of metal at all of the points at which machining is to take place. This special gage locates from the inside of the No. 2 and No. 5 cylinder barrels, and by stops against the valve tappet bosses. Fixed in the gage are a number of scribes to check the amount of metal at the points to be machined and also stops which must come against the various surfaces of the casting to show that there is sufficient metal at all points. Some castings, when they come to the plant, contain irregularities which render them unfit for use. This inspection gage catches such irregularities. Consequently, the cost of the block is not increased by machine work being followed by a rejection which could have been determined beforehand. This cylinder block ranges around 220 lb. in the rough. The finished block ranges around 180 lb. An average of 40 lb. of metal is removed from each cylinder block.

The blocks are allowed to age before being passed on to the manufacturing floor. They are kept in a special receiving room adjacent to the railroad siding, and after they have aged are sand blasted and passed out to the manufacturing floor on Standard roller conveyors. They are then given a coat of special dirt-proof paint. This is a Rogers product specially designed to keep the inside of the block clean. It differs from the usual paint in that alcohol is used for the vehicle in place of turpentine.

Machine Operations

The first actual manufacturing operation on the Ansted cylinder block is interesting because, while it has nothing whatever to do with the actual finish of the engine, it lays the foundation for manufacture which results in sharp jig economy and, at the same time, is the beginning of a system of location which materially cuts down any chance of error. The operation is the milling of the locating bosses on the right side of the block. These bosses are put on the cylinder block for no other purpose than to form a basis of location, and in milling these bosses, the block is located from the No. 2 and 5 bores in the same way that it was on the inspection jig. The work is done on a Chesterlein No. 34 heavy type of plain miller. The bosses are milled off and give a surface which is square to the centerline of the No. 2 and 5 bores.

The block is then placed on the conveyor and taken to another milling machine, where the top and bottom faces are milled. The particular milling machine which does this work is an interesting type, owing to the rapidity with which it operates. It is a Davis rapid miller with a rotating table capable of holding four blocks at the same time, giving continuous milling. That is, while manufacture is going on the table can be loaded from the outside so that there is no necessity for stopping the machine for reloading. In this work the block is located from the locating bosses previously milled and from the No. 2 and 5 bores. The machine is capable of producing 12½ per hr., or 125 per 10-hr. day.

The Davis rapid miller takes two cuts, the first being the roughing and the second the finish cut, so that after the block leaves this machine it is capable of location from the top and bottom faces as well as the locating bosses. The faces of the crankshaft and camshaft bearing holes are next milled, the location for this work being from the center line of the casting between the No. 3 and 4 cylinder barrels and the bottom face. This work is done on a No. 34 Ohio miller capable of 62 per 10-hr. day.

The next operation is a foundation operation which establishes the location for all of the rest of the work on the cylinder blocks, and since it is utilized in this way, it does away with the shifting of location, which is apt to lead to trouble and which makes it difficult to trace down errors. The operation in question is the drilling of locating holes which are used only for this purpose. There are two holes ½ in. in diameter which are drilled and reamed on a Wickes Bros. drill. These two locating holes, together with the top and bottom faces, are used for practically all of the subsequent operations and give a very simple system of location, which has greatly helped in simplifying the jig and fixture requirements for manufacturing this block.

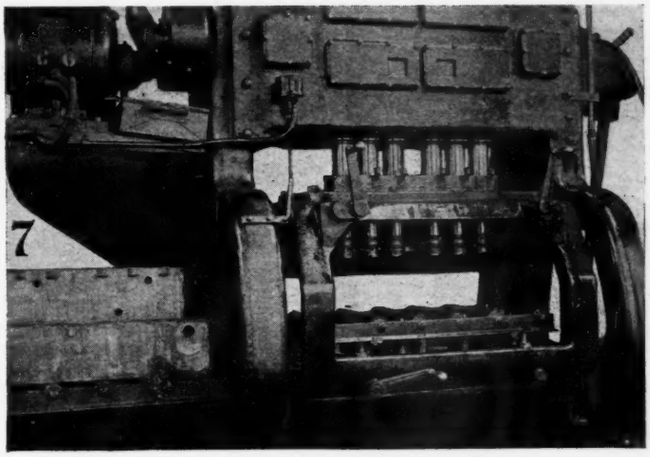
The block is end milled on both ends on a Davis No. 3 rapid miller. This milling machine holds nine blocks at the same time and has a continuously revolving table. The machine is capable of 240 blocks per 10-hr. day, taking both rough and finish cuts on both ends at the same time. For final finish, the blocks are passed to an Ingersoll miller which takes off .020 in. of the finish cut from the top and bottom of the casting. This machine is so arranged that an auxiliary cutter comes in after the timing flange has passed by and mills off the pump pad boss and the control lever bosses. The casting is put through the machine, standing on its side, so that the top and bottom milling are side cuts and the cutter for the pump pad and control lever bosses comes down from the top, after the timing flange has passed by. The limits on the top and bottom finish milling cuts are plus or minus .005 in.

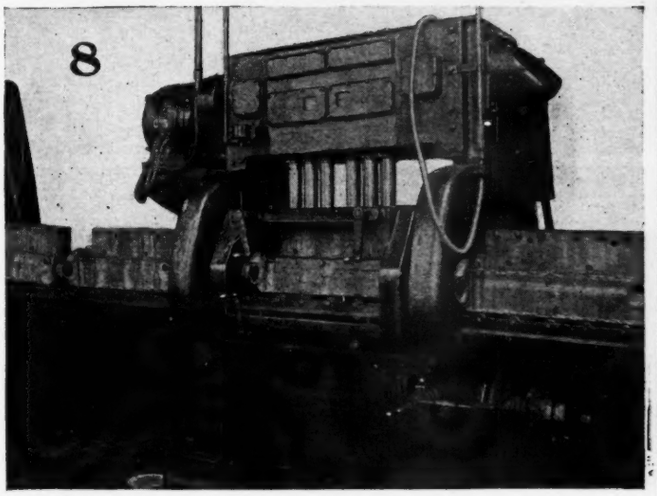
A LeBlond miller is used for milling the camshaft rear bearing pad. This operation is located from the locating holes and from the bottom surface. About ⅛ in. of metal is removed, the capacity of the machine being 62 per 10-hr. day. The block is then placed on a conveyor and starts through a battery of two No. 8 Defiance machines for cylinder boring. The first machine is a rough bore and the second a finish bore. The capacity of the outfit is 20 per hour, all six cylinders being bored at the same time. The location on this work, as on practically all of the following work, is from the locating holes and from the bottom face. On the rough bore the diameter of the cylinder is increased from 2 15/16 in. up to 3⅛ in., and on the finish cut the bore is increased from 3⅛ in. to 3 5/32 in. An interesting feature of the work on this battery of machines is that the conveyor extends over the table, allowing the block to be rolled directly into the machine. When a lever is pulled the conveyor drops below the supporting table level and the jig is clamped in place.

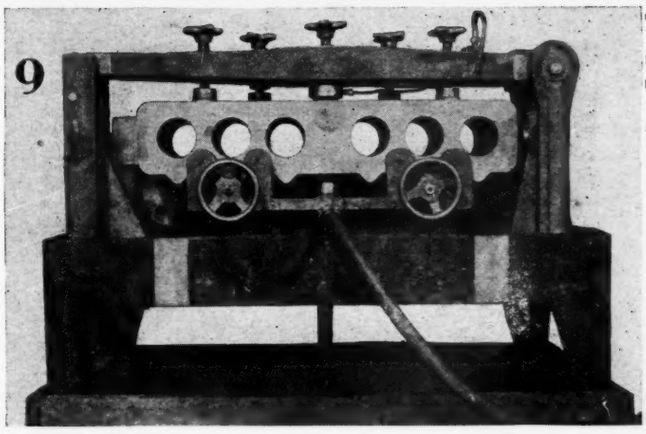
Chambered Cylinders

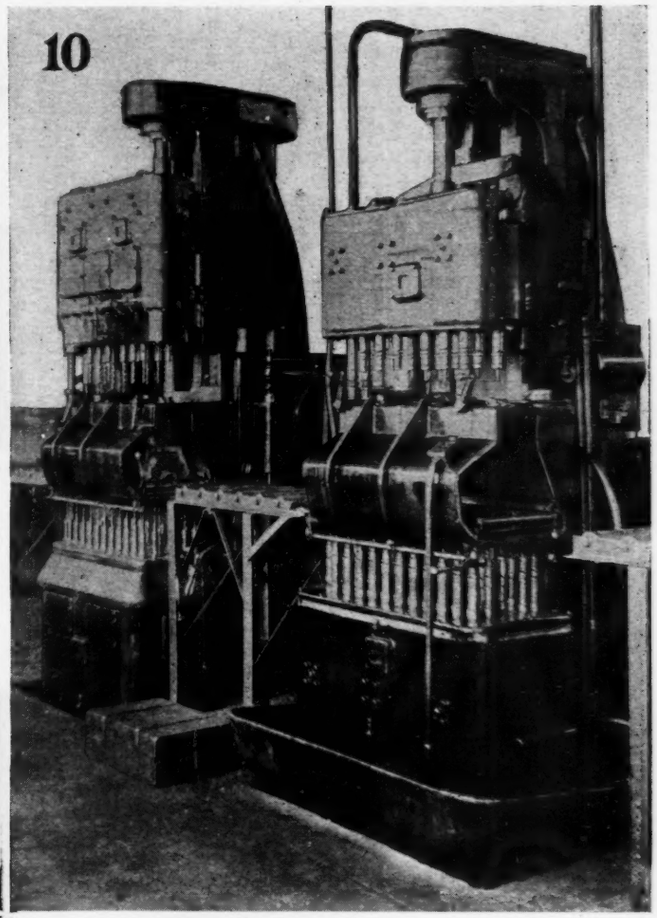
As the combined diameter of the two valves in the cylinders is larger than the cylinder bore, it is necessary to chamfer the cylinders for valve clearance at the top. This is done on a six-spindle Defiance machine, which takes this cut from the top of the cylinder. When this operation is complete the block is moved to a water testing jig for jacket leaks. The jig contains covers for the core holes and is so arranged that 45 lb. pressure can be put on the casting to check leakage.

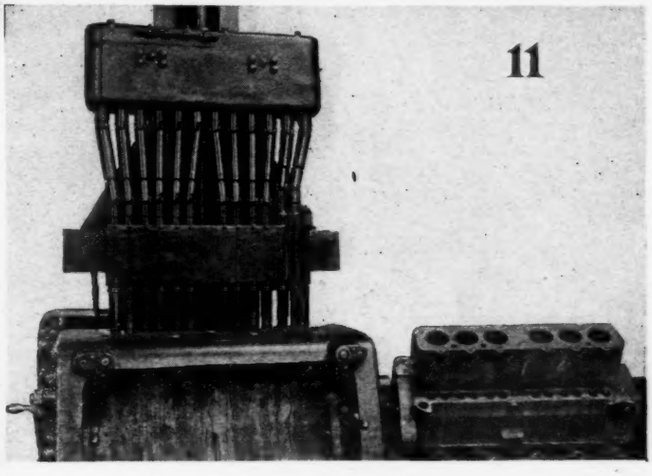
The next manufacturing operation is to mill the tappet boss, which is done on a Becker miller having a capacity of 45 per day. The location in this case is by the locating pads and the bottom face.



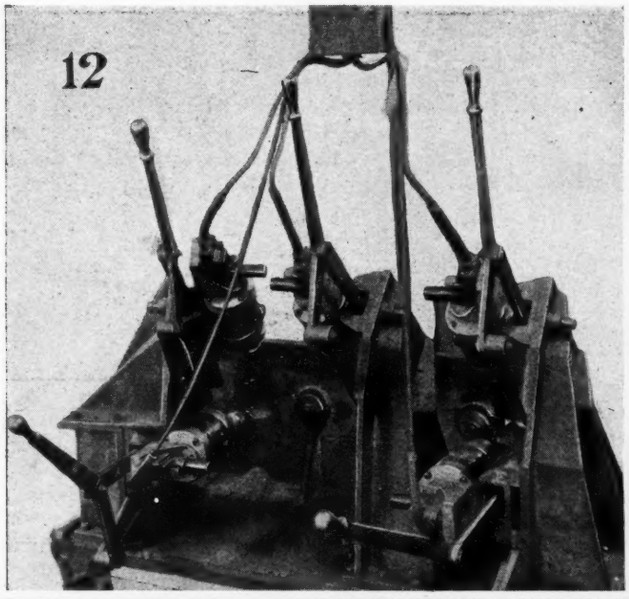


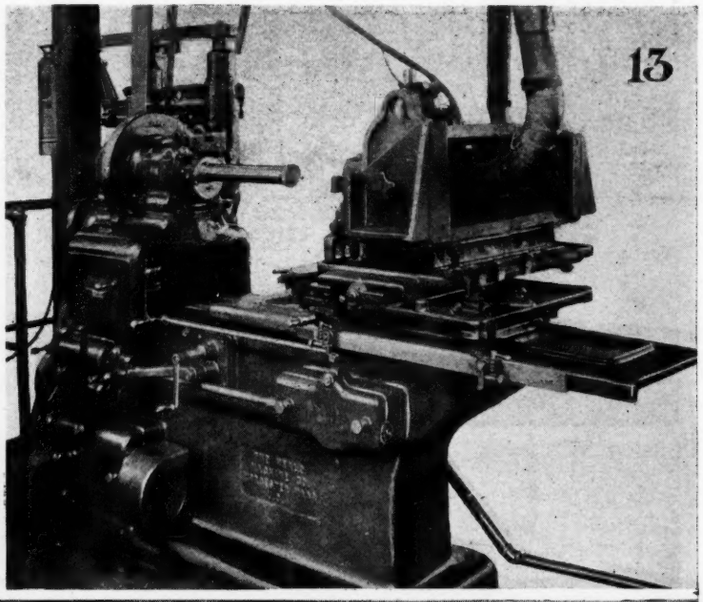


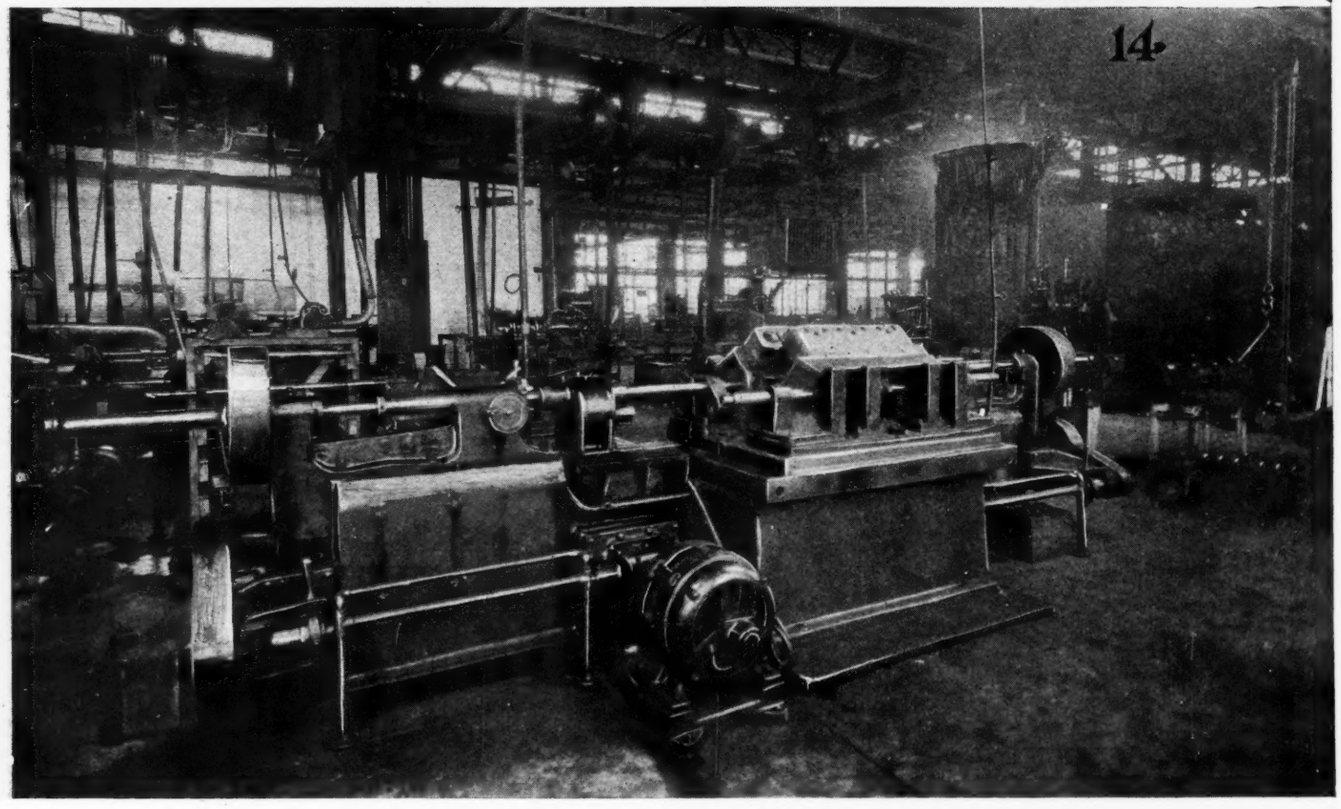




7—Rough cylinder boring machine operation. No block is shown in this machine so the jig construction may be illustrated. It will be noted that it is a tunnel jig with the roller conveyor in the jig so that the roller conveyor is continuous through the machine. The conveyor drops out of the way when the machine is in operation. 8—*The finish boring machine. Only two boring operations are performed on this job. These two operations bring the barrels to grinding size. On this machine as well as on the rough boring machine will be seen an electric safety stop. The machines are directly driven and if the regular stop on the machine did not work the current to the motor would be shut off before damage could be done to the machine.* 9—*The water testing fixture. This operation comes after the finish bore and the fixture is clever, the arm across the top swinging upward, leaving the entire fixture open for the setting of the cylinder block. City pressure, which is about 54 lb., is used for this test and the block is left in the fixture for about 5 min. Two of these fixtures are used so that a man is setting a block in one while the pressure is on the other. Arrangements are being made to have this test made with hot water.* 10—*Defiance drilling and tapping machines which take care of the top and bottom holes at the same time. Another pair takes care of the horizontal holes in the same way.* 11—*Machine and fixture which drill the valve lifter guide holes in the side of the cylinder block. It will be noted that this drill carries 13 spindles, one of which is offset, being the extra spindle that drills the hole for the distributor. This is driven from the front end of the camshaft by means of a worm gear. Combination tools which ream as well as drill these holes are used on this machine*







12—This shows a machine which is partially machine and partially fixture, designed and built in the Ansted shops. The oiling of the Ansted engine is accomplished under pressure and oil leads from the main bearings to the camshaft bearings are drilled in bosses, cast for that purpose. Five holes are required and all of them are at different angles. This fixture provides an electric drill for every hole set at its proper angle and a slide is provided. This entire tool cost $1,500, whereas to do this job on standard machines would have cost in the neighborhood of $12,000. 13—Grinding the cylinder. Note the exhaust suction pipe which removes grit directly from bore which is being ground. 14—Boring the main bearing and camshaft bearing holes. Rough caps are fitted to the main bearings during this operation so that the cutters get a full bearing. The fixture on this machine swivels so that one block is being set up and bars inserted while the other one is being machined. The camshaft bearings step down in size from the front. The main bearings step down in size from the rear. It is apparent, therefore, that in boring both of these lines at once they must be bored from opposite ends and the machine is therefore a double-end machine. The extra spindle shown in the left side of the machine is for a stud tool which bores and sizes a hole in the front gear housing, which is provided for magneto installation when necessary

One of the most interesting series of operations is that which now takes place. A group of four Defiance drilling and tapping machines is employed for this work. The first machine drills all of the top and bottom holes at the same time and is capable of easily taking care of 20 per hr., the capacity of the machine never having been reached in this plant. This would mean an excess of 200 per day, if desired. The second machine taps these same holes. The first two machines have 68 spindles each. The block is then moved to a second pair of machines which drills and taps the horizontal holes, taking care of both ends at the same time. These machines are equipped with electric stops which automatically kick off the motor should a spindle break or any other accident happen. The machines are operated by push buttons and stop automatically after the work is completed. The location of the work in these machines is by the locating holes and the bottom face of the casting.

The valve tappet guide holes are drilled and reamed, twelve at a time, on a Defiance machine, which also has a thirteenth spindle for drilling and reaming the igniter driveshaft hole. The location for this work is the bottom face of the casting and by dowel pins in the two locating holes. The machine is capable of taking care of 135 pieces per 10-hr. day, the diameter of the holes being 1¼ in.

A number of minor drilling operations follow this work, these including the cleaning up of the water circulating and oil regulation holes, drilling and tapping the ignition drive flange holes, the valve guide dowel screw holes, oil feed holes, etc. American radials are used for this work. The control rod holes are drilled on a gang radial drill, the holes being drilled in from both sides. This machine also bores the oil pump retainer flange hole and the retaining screw holes. A box jig is used for this work, the location being from the two locating holes and the bottom surface of the casting.

The next operation is to counterbore the core holes for Welch plugs, after which the spark plug holes are drilled, counterbored and tapped. This work is done on an Avey drill, the work being carried along on a jig which travels on a track below the three spindle drill, the three spindles, of course, being for drilling, counterboring and tapping.

The main bearings are bored on a Rockford horizontal drill with two bars operating at the same time. These roughbore the camshaft and crankshaft bearings simultaneously, the bearings being stepped for tool clearance. This operation is a roughing cut, the machine being capable of 40 per day. The finish cut is also made on a Rockford machine, this being a double ended unit which flycuts the crankshaft and camshaft bearings simultaneously. This machine is capable of 4 per hr., or 40 per 10-hr. day. The camshaft and crankshaft bearings are cut in from opposite directions, which allows the largest crankshaft bearings to be at the flywheel and the largest camshaft bearing to be at the timing gear end, as required by best engineering practice.

An ingenious layout is used for drilling the oil holes. These run in various directions, not square to either face of the casting, and are handled by independent electric drills. These are of Van Dorn manufacture and are arranged in a battery of five on a single jig.

The finish cut on the bearing for both crankshaft and the camshaft is taken care of by hand reaming at the present time. Eventually, air-driven Kelly reamers are to be installed. This operation takes a very light cut from the metal, the bearing being practically finished by the flycutting operation on the Rockford drill previously mentioned. Following this, the bottom of the cylinders are chamfered on a Baker Bros. milling machine, the oil gage and suction line holes are drilled and tapped on a Barnes drill and the magneto opening cover plate holes are drilled and tapped on an American radial. The magneto installation, of course, is only used on the export cars.

On a Binsse Machine Co. horizontal miller adapted particularly to this work, the rear crankshaft oil thrower ring groove is cut and the bearings are milled off to proper length. This machine operates with a cross feed, the blocks being fed up to the cutter.

The cylinder blocks are then washed in a Blakeslee washing machine, being washed with Oakite solution. They are air dried in an oven and sprayed with a primer, baked and then enameled and baked again. The cylinders are then ready for grinding, the grinding being the final operation, so that the heat of the drying oven for baking the enamel will not distort the castings after grinding. The grinding is done on No. 60 Heald grinders with Norton 303S wheels. From .010 to .015 in. of metal is taken off, the limitations on the work being plus or minus .00025 in. Exhaust fans are placed over the open end of the cylinder upon which grinding is taking place to exhaust the grinding dust immediately.

Sequence of Operations in the Manufacture of the Ansted Cylinder Block

Chip snags
Snag grind
Sand blast
Chip, remove wires, blow out with air and paint
Inspect sand holes, etc.
Mill locating pad in water manifold
Mill face front, main and camshaft bearing
Rough mill top and bottom (Davis)
Mill top, bottom and oil pump pad (Ingersoll)
Drill and ream two ½ in. locating holes
Mill rear camshaft bearing
Mill both ends
Rough bore cylinder barrels
Finish bore cylinder barrels
Inspect all preceding operations
Water test
Mill valve lifter guide flange and mill oil regulator pad
Drill and holes top and bottom
Tap all holes top and bottom
Drill all holes, both ends
Tap all holes, both ends
Drill and ream valve guide and timer holes
Drill 12 water circulation holes
Drill ½ in. oil relief holes
Drill one 23/64 in. hole
Drill two 17/64 in. holes
Tap two 5/16-4 in. holes
Tap two ⅜-24 in. holes
Countersink all tapped holes
Ream .375 holes
Drill, ream and tap all holes on both sides of block except core hole
Countersink and tap six 5/16 by 24 holes, bore and counterbore for plugs
Drill, counterbore and tap for spark plugs
Assemble rough cap for main bearing
Inspect all operations up to and including water test
Bore and ream crankshaft and camshaft brgs. and spot face magneto locating bearing
Dis-assemble
Drive five oil holes in main bearing
Drill one 7/16 in. and one 21/64 in. hole and counterdrill 9/16 in. hole
Tap ½-20 in. and tap one ⅝-18 in. hole
Drill and tap guide lock screw holes
Drill and tap timer bracket holes
Drill and tap oil lead holes over rear brg.
Drill three magneto pad holes
Tap two ⅜-24 holes and ream one 11/32 in. hole
Hand ream push rod guide holes
Chamfer bottom of barrels
Countersink all tapped holes and retap
Drill and tap ⅛ in. compression test cup holes
Mill combustion chambers
Straddle face main brgs. and cut oil slinger slot
Wash and put in Hubbard plugs
Grind barrels

Refinements in Chassis Construction

(*Continued from page 60*)

case of the front end of the chassis they furnish additional protection against collision, particularly protecting the radiator against the minor collisions which are constantly occurring in the congested parking centers. Cole uses a heavy tube at the front end of the chassis and Templar at both ends. An interesting chassis stiffener is the large flat plate at the rear end of the Stearns. This extends across the entire rear end of the chassis and beside providing a stiffening member acts as a foundation for the rear tire carrier.

One of the greatest lines of improvement in the chassis is the incorporation of anti-rattle features in the brake mechanism and in the shackles. In the brake linkage there has been a noticeable growth in the use of tension springs which keeps the linkage continually taut so that there is no chance of rattle. On the Oakland cars these little coil springs are very ingeniously mounted under the cross member which supports the brake equalizer shaft. The springs are smaller and more compact than usually employed for this work and are hung upon retainers which are free to rock in the cross member.

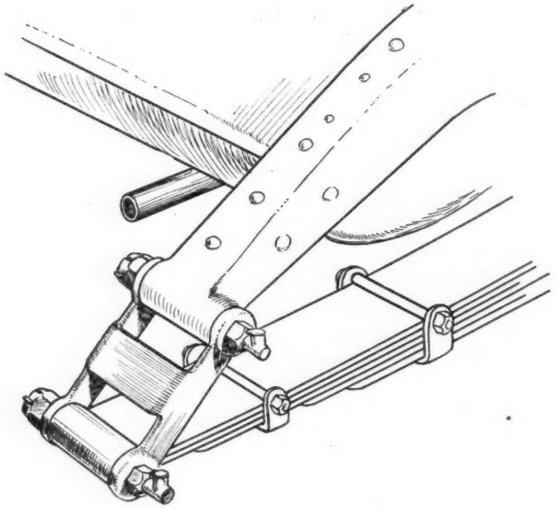
In preventing rattle in the shackles, which are notably the worst offenders in this respect, the use of the adjustable shackle on the Locomobile and on the new Navarre, designed by A. C. Schulz, formerly of Locomobile, are of interest. These have a take up secured by a clamp, which permits of compensation for wear. On the Navarre the spring is allowed to center itself on the bolt and then the bolt retainer is brought against a washer which is forced against the spring. Since the spring is allowed to center itself before the bushing is screwed against it, it is not necessary to hold the spring width to close limits in manufacture. The adjustment is held tight by a clamp bolt, the end of the frame horn being split.

From the standpoint of spring suspension the only radical developments apparent are the Roamer double cantilever, which is already familiar to most of our readers, and in the only German product shown. This is the Sauer on exhibit at the Commodore. It has a cantilever pivoted at the center with a rocking seat on the rear axle very similar to the Rolls-Royce suspension. In the Roamer installation the noteworthy point is that the cantilever arrangement is used in conjunction with Hotchkiss drive. The springs are super-imposed, one member being supported at the bottom of the brake drum, pivoted and anchored on the chassis by a forging and the other member being similarly mounted by a pivot point at the top of the brake drum and anchored at a point on the chassis ahead of the center on the lower member. The bottom unit is intended to check shocks and the top to check rebound.

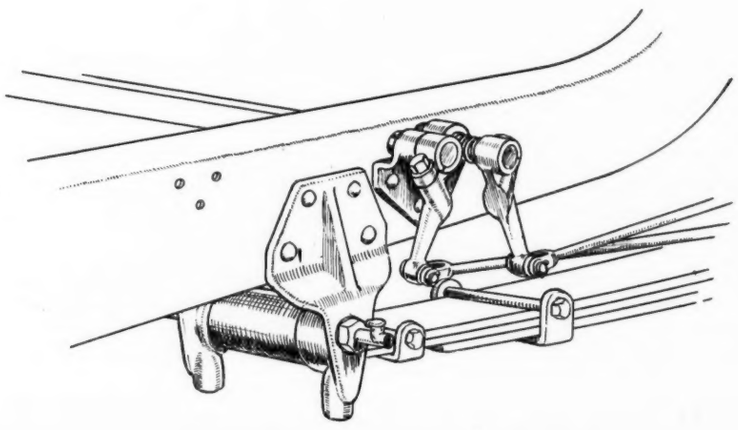
There are a number of variations in practice in the supporting of the rear end of the rear semi-elliptic spring. Where the frame has tapering side members, many designers are making an effort to take the twist out of the spring by keeping the spring itself parallel to the center line of the car. The use of a prominent drop in the rear end of the frame to coincide with the flatter spring suspension is quite a prominent feature and a few makers are sweeping the horn down for the purpose of dropping the side rails slightly, making the rear shackles tension instead of compression members.

Throughout the entire line of exhibits there has been a notable effort to increase the stiffness of the frame through the use of deeper side rails, by a greater number of cross members and by more thorough gusseting. There are a great many frames which taper materially in depth. For instance, the Scripps Booth, which is very noticeable in this respect, the depth of the frame being constant for only a short portion of the length. The Maxwell is another example in which the frame tapers considerably in depth. The majority of frames, however, have only slight taper and this takes place at the extremities. The bottleneck type has about disappeared and in its place the tapered frame is used to get the narrow front end necessary to give narrow turning radius and a sightly front end.

There are not any noticeable steering developments except perhaps in the lubrication of the parts where practice has been improved in line with what has already been said under the head of chassis lubrication. There is, however, a tendency on the part of a great many to use heavier oversize parts. The Hupp has been materially strengthened in this respect, the steering gear having been entirely revised and a larger unit installed.



Spring shackle at rear end of Paige rear spring



Front connection of rear spring on Paige

Clutches, Transmissions and Universal Joints

By Herbert Chase

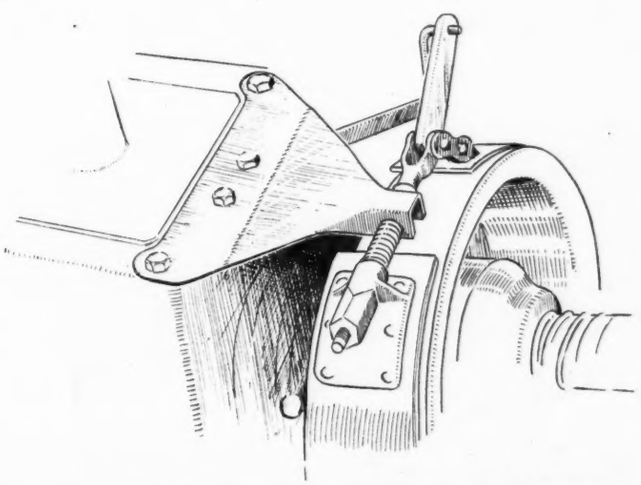
THERE is little that is really new in the way of clutches, although some makers have changed the type employed. Substantially all of the higher price cars use the multiple disk type running dry and faced with molded or woven asbestos composition. The new Pierce-Arrow chassis is fitted with this type, having finally abandoned the cone type, which was standard on chassis built by this company for many years. There are to-day in this country but few makers who continue to use the cone clutch and the tendency both here and abroad is toward the multiple or the single disk type which, as a rule, is smoother in engagement and less apt to cause clashing of gears when changing, because it does not continue to spin so long after disengagement. The plate or single disk type is very widely used in this country as it is also in Europe. It requires, however, the application of considerable pressure on the friction surfaces to prevent slipping, and this in turn means relatively rapid wear and a heavy pedal pressure unless a considerable multiplication by levers is employed, and even then the pedal pressures frequently used are excessive. This, indeed, is a point in which there is much room for improvement. In the case of cars driven by women, in particular, it is a serious mistake to use high pedal pressure, and it certainly does not add to the pleasure or comfort of any driver to be required to use unnecessary exertion to declutch the engine when changing gears.

There are several ways of overcoming this drawback. One is to use multiplying levers somewhere between clutch pedal and the disengaging member, as is done in several European and some American designs, Lincoln, Packard and Dorris being cases in point. Another is to use a larger number of disks with lighter springs, as is done on the LaFayette, or to employ some of the more recently developed materials which have a higher friction coefficient. A larger diameter of friction surface can also be used, but in this case means to stop spinning on disengagement are doubly important.

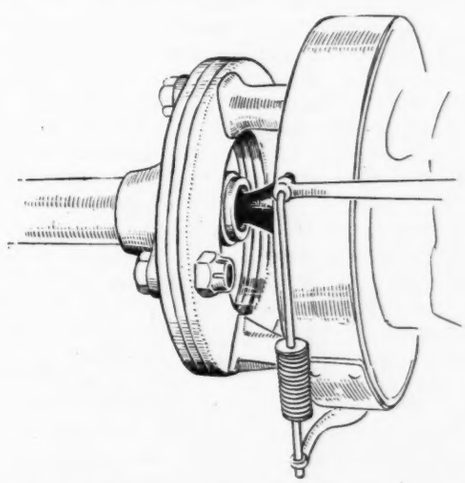
It is possible to design clutches that require no adjustment throughout the life of the facings, but most types in common use require occasional adjustment or other attention, hence it is desirable to make them as accessible as possible. This has been done on many cars exhibited, the Briscoe, Nash and Dort, for example, but many others are not easily accessible and in most cases it is necessary to remove the transmission when it becomes necessary to dismantle the clutch for refacing or major repairs. In some very recent designs it is not only necessary to remove the entire transmission in order to dismantle the clutch, but before this can be done the spring bolts must be removed and the entire rear axle be moved back! Inaccessibility is partly due in most cases to the use of a closed bellhousing. In other cases the bellhousing is open at the bottom, sometimes having a removable cover top and bottom as in the Cleveland. While the need for ready access to the clutch is not so important a factor as it used to be with the earlier cars, it should not be forgotten, even though the use of the unit powerplant has introduced a factor that has not simplified the problem of securing accessibility.

The clutch thrust bearing has in the past been a source of much trouble, hence it is pleasing to note a tendency to improve the design in this particular. Better and larger bearings are provided and the practice of using a forked throwout lever engaging with pins on the casing for the thrust bearing is being abandoned in many designs. When levers or cams with contact only on the forward face of the bearing casing are used the latter is free to rotate with the clutch, so that the bearing runs only when the clutch is disengaged, and not continuously as in the other type. Obviously the bearing will require less lubrication if it runs only when the clutch is disengaged. It can in this case be packed with enough grease to last for many thousand of miles, while in the other case it requires frequent lubrication, and a grease cup is often provided, this cup being placed above the floor boards in some cases, so that it will not be forgotten. In the Kissel car an oil lead was carried to a point near the rear engine cylinder where an oil cup was fitted, the idea apparently being to make it easy to oil the clutch bearing whenever valves or other parts under the hood are oiled.

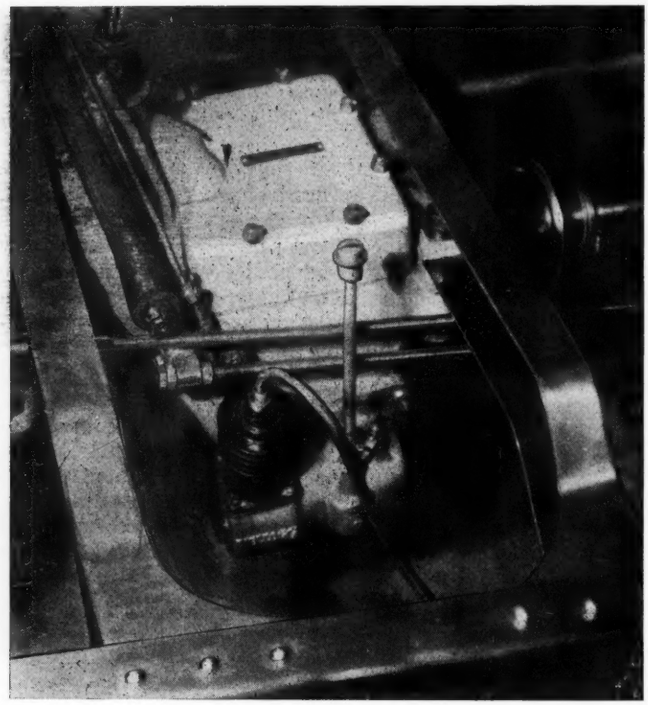
Apparently chassis designers are mostly men with medium length legs, otherwise more frequent arrangement would be made for adjusting the pedals to accommodate



Transmission brake support on Nash



Central guide for fabric universal joint on Briscoe



Air pump mounting on Pierce-Arrow transmission

the short or long legged driver. This is a very simple thing to do and is done on many cars. The practice might well be followed by all. A detail which most makers overlook is provided in a few cars, that is the fitting or rubber covers on the pedals, as on Pierce, National and LaFayette, among others. Serious accidents have been known to occur as a result of an operator's foot slipping off the clutch or brake pedals in a tight place or when instant action was required. This possibility is minimized by the use of rubber covers. Pedals so covered are also easier on the feet and help to prevent the feet from becoming chilled in cold weather. They should be more generally used.

Transmission

Novelties in transmissions are very few indeed. It is getting to be well nigh universal practice to rigidly connect engine and transmission, forming a unit powerplant by the use of a bellhousing, which encloses flywheel and clutch. This construction renders the use of flexible connection between clutch and transmission unnecessary, and departures from it involve expense which make the practice of fitting the transmission amidships almost prohibitive except in the higher priced cars, and even the newer higher priced jobs, such as Lincoln and LaFayette and Fergus, make use of the unit construction. Thus the transmission is usually supported from the engine, its weight being carried by the rear engine arms or a cross member of the frame bolted to the crankcase just forward or just aft of the flywheel. The overhang is frequently considerable, but the conical bellhousing and boxlike section of the transmission case provide the necessary rigidity, especially when the double universal joint construction is employed, as it so frequently is.

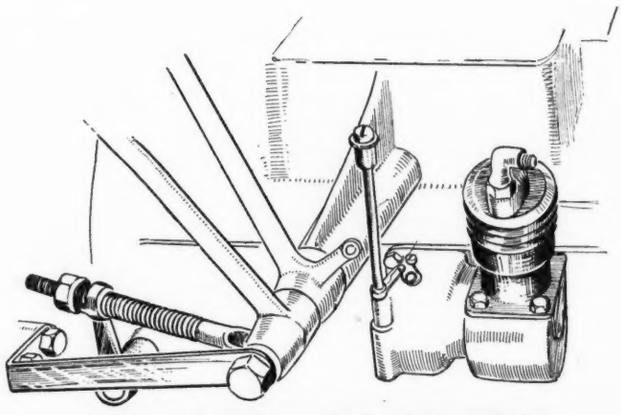
The use of three-speed gear boxes is more nearly universal than the unit powerplant. Three speeds are used in the new Pierce-Arrow, Packard, LaFayette and Lincoln chassis, but the Mercer uses a four-speed box. No one has attempted to emulate the British and Continental manufacturers in producing a light chassis with small size highly efficient engine and four-speed gearset, though such a procedure would seem to be called for if the fuel stringency so long promised becomes a reality.

The Fiat has a novel gear shifting mechanism. The shifter forks are carried on a cross shaft which is moved axially by side motion of the shifter lever. The change of gear is then made by rocking the cross shaft through motion of the hand lever forward or back in the gate. A single pair of links, one with ball and the other elongated socket ends imparts both lateral and rocking motion to the shifter shaft. Aside from this the changes noted in the design of the gearbox lie chiefly in the addition of appendages in the form of air pumps and propeller shaft brakes. Many of the latter are fitted, among them being Nash, Cleveland, Briscoe, Mercer and Citroen, and these for the most part are emergency brakes, a departure from the practice formerly employed of fitting the foot brake on the propeller shaft. Most of the transmission brakes are of the contracting type, the band being anchored to lugs fastened in sockets cast on the transmission case or to integrally cast extensions of the case. In the case of the Nash six, however, the brake anchorages are made from stampings bolted to the transmission case. In a few of the more expensive chassis, such as the Mercer, the transmission brake is of the expanding type, the drum having cooling ribs and the shoes being placed between the drum and the transmission. This makes it possible to use a camshaft running through or beside the gearbox parallel to the gear shafts and a neat linkage with a short pullrod connecting direct to the brake pedal, the brake in this case being the service instead of the emergency brake.

A considerable number, especially of the higher priced cars, among them Packard, Locomobile, LaFayette, Pierce and Dorris, are fitted with gear driven air pumps. These are nearly always mounted on the left side of the gear box and have but one cylinder. They are usually thrown into and out of engagement by turning a short vertical shaft which extends upward through the floor boards, or horizontally through the side member of the frame. Many makes of gear box are provided with S. A. E. standard opening to which the air pump can easily be connected by the purchaser if the manufacturer does not fit it as regular equipment.

It is almost universal practice to mount the gear shifting lever on a pedestal directly over the gear case. This makes a compact and neat arrangement which is sightly and provides a convenient means of bringing the control through the floor boards. The gate formerly used is no longer required and is used on only a few cars, Fiat and Stutz among the latter.

Holes through the floor boards are frequently made larger than necessary for the controls, thus admitting to the space above them noise, grease and cold air, which



Air pump mounting on Packard transmission

would be largely excluded if the space were closed by a flexible material or other means. A refinement in this direction would be especially appropriate when closed body is fitted.

On the whole, controls are more conveniently arranged than heretofore. Room for egress is usually provided, yet the gear shifting lever is so placed that it is easily reached by the operator. An offset lever is employed in many instances.

Speedometer drives are mostly from the transmission. Spur gears are frequently used for this purpose, but the neatest and best drive is the spiral gear, employed on Lincoln and some other chassis, for it is noiseless and can be made compact.

A commendable practice is that of fitting transmission locks as is done by Lincoln among others.

No marked advance in universal joint construction is noted, but improvements in detail, especially in lubrication means, are occasionally in evidence. In the LaFayette and Fiat chassis, for example, the single universal is lubricated by oil from the gearcase. One parts manufacturer (Merchant & Evans) is exhibiting a system of lubrication in which oil is forced through the universal joints and hollow propeller shaft to the rear axle, from which the lubricant is returned to a tank on the dash and again fed to the transmission. More hollow propeller shafts are being used, the solid ends being welded in place.

The metal joint predominates and is manufactured in a large variety of patterns, most of these being enclosed in metal or leather covers, but some are not enclosed and no adequate provision for lubrication made. Many makers employ flexible disk joints of fabric with rubber impregnation. Those used on the Briscoe chassis are held from radial displacement by the use of a centrally placed ball and socket. When a separate gearset is used the universal connection with the engine is generally of fabric, but Sauer, the only German chassis shown, uses a laminated metal disk for this connection.

The disk wheel is in great prominence among the special show cars. On the Franklin are the new Parker aluminum disk wheels which have been lately introduced and which, of course, have the quality of lightness to a marked degree, being about 15 lb. per set lighter than wood on this particular installation. Growing numbers of manufacturers are offering these wheels as optional equipment, the retail prices for this equipment averaging around $125 per set.

Passenger Car Bodies at the Show

By George J. Mercer

THE body display at the show this year is very interesting especially in the brighter color combinations, clean cut trimming designs (particularly in the finish on the edges) and the uniformly good looking tops on the open cars. There are an unusually large number of sport type touring cars and runabouts with cycle mudguards and steps in place of the runboards. These are generally fitted with disk or wire wheels and an increased number of cars have side wings on the windshield, and cowl lamps, in most cases attached to the base of the windshield itself. Nickel plating of radiators is more general and there is, altogether, a brightening up that cannot help but please the prospective buyer.

The keynote of the body display is the general refinement in detail. The models displayed include the conventional runabout, touring body, coupe and sedan, while the exhibitors of the more expensive cars show the two compartment closed body and a few town car types. Most exhibitors, however, seemed to have concentrated attention on the open cars in an effort to change the appearance or add new features.

The runabouts shown appear more substantial looking than in former years. There is no increase in the seating space, but the carrying space at the rear is larger. The runabout is essentially a two-passenger car and all attempts to take it out of this class have been abortive. These bodies have generous seating space, comfortable cushions and backs, and good height to the body side. The use of steps in place of runboards works out well on this type of car, as it gives the driver a near ground view when driving fast. The illustration of the top, Fig. 1, shows that even on this body type the tendency is to use the car with the top up. The use of the wings to the windshield are necessary when this top is used, as they help to prevent the wind pocketing under the top.

Two views of windshields are shown in Figs. 2 and 3, one portraying the side wings and the other a type used for protecting the tonneau. This latter is not commonly

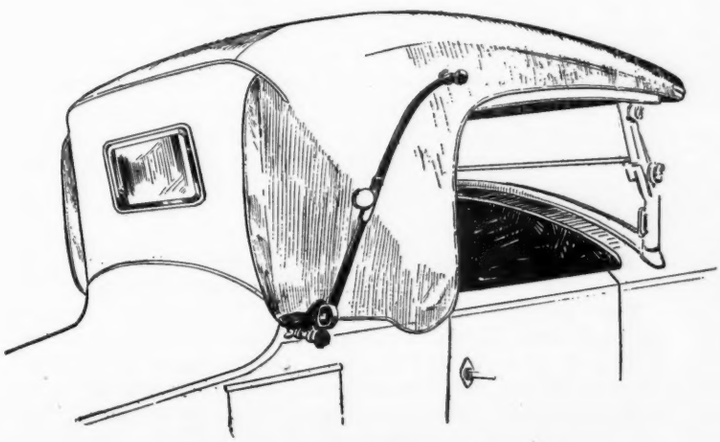


Fig. 1—Cole runabout with top raised

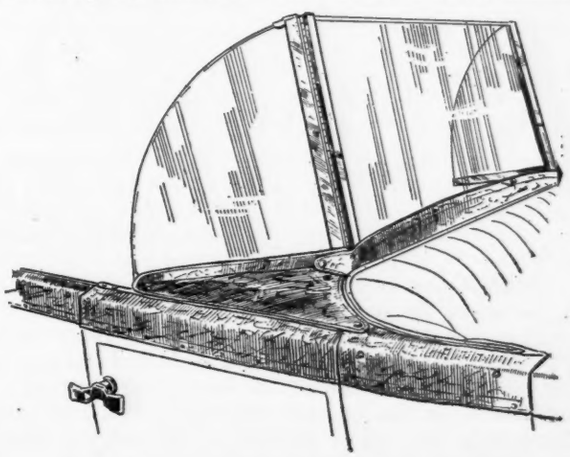


Fig. 2—Tonneau windshield of Roamer car

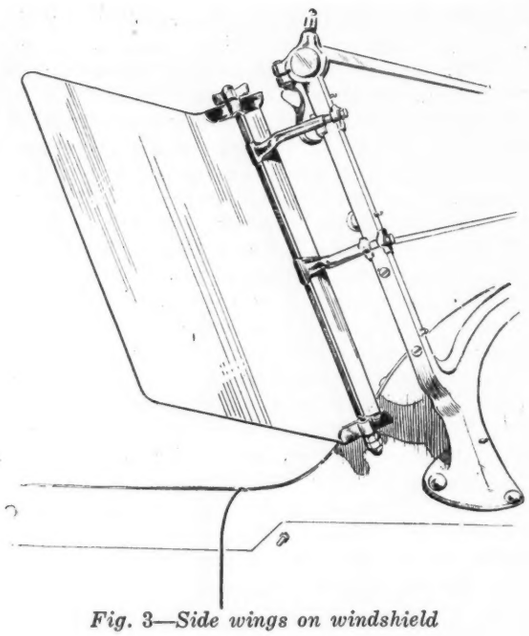


Fig. 3—Side wings on windshield

used. In this case the top of the body is protected by a leather skirt.

Windshield frames, like some of the other parts of the car, are being nickel plated. On some of the smart types of touring cars and runabouts, the nickel work included the radiators, windshield frames, lamps and door handles. The steps which often replace the runboards are cast in white metal and polished.

Fig. 4 shows a novel method of fastening the windshield to the body. It exemplifies the refinement in detail already referred to. Another part of the car that benefited by a change is the radiator. Addition of shutters has unquestionably improved the appearance of the front end of the car. The shutters are sometimes placed in a vertical position, but they are usually horizontal.

Refinement in open cars has been of a character that will be permanent. The brighter color combinations with striping will be more in evidence during the coming season than for many years past.

The buyer is attracted by the opportunity for individualism. He is often satisfied if this can be gained in the color scheme. There are no color combinations but there are more cars painted in colors and they are uniformly good. Workmanship and finish average better than usual. In general, the best colors were the blues, that is, the Rolls Royce or Belgian blue. The striping was usually white. Some of the wide stripes had hair lines at each side. When this is used in moderation the results are pleasing. There were cases in which the striping did not logically carry out any design pattern, but was continued from the flat over rounded surfaces. The tendency for some years past has been to eliminate striping on all except very high grade work, hence the art has, to some extent, been forgotten.

The disk wheel does not allow much latitude in the matter of colors. The very best results are obtained when the color used on the disk is lighter than the body color.

Some of the closed cars use bright color combinations with the upper part black, lake maroon, blue and gray being used to good effect in some cases.

Colored trimmings are less in use on open cars this year. There were isolated cases, but the majority used the conventional black leather for cushions, and imitation leather for the flat parts and on doors. On closed cars the trimming colors were modest and of inconspicuous pattern with very modest appointments.

Real comfort in the seating has made progress, but there is still room for improvement on many cars. The runabouts usually have comfortable seats, the height of the cushion in relation to the sides being generally low. The slope of the cushion and back are sufficient. Too many touring bodies lack this, and with the majority of five-passenger bodies there is an opportunity to give more room forward of the driver's seat. Seven-passenger body practice sometimes involving a cramped front section has in some instances been followed in the five-passenger model without logical reason. The cushion and back, when of the right angle or slope and height, together with correct height of body side as a retainer, will hold the passenger in without effort on his part when rough places in the road are encountered.

The tendency in design is toward more rounded surfaces, in contrast to the angular lines which have been the prevailing tendency for some time past. Production methods require as many units as possible to be interchangeable on several models, hence rounded radiators and hoods which blend readily with other rounded surfaces are in favor.

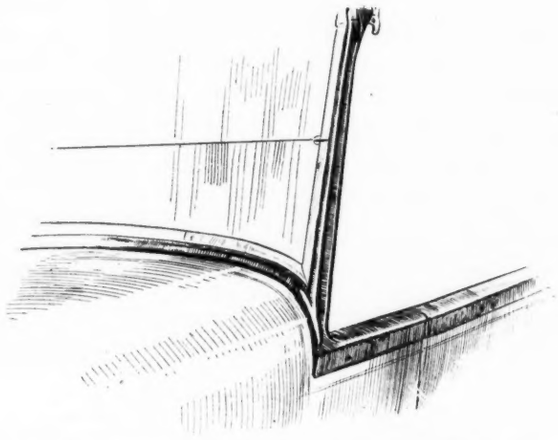


Fig. 4—Novel method of fastening windshield frame to body

New British Light Car

A SMALL air cooled car with friction drive has been placed on the British market and was exhibited at the recent London show. The engine is a two cylinder opposed, 3⅜ x 3 7-16 in., with steel, flanged cylinders and cast iron heads. The main feature is that the engine, rear axle and all of the transmission gear are carried on a sub-frame and are really built up as one unit. This unit is pivoted on a cross member of the frame at the front and attached by the springs at the rear. No universal joints are therefore required, nor is there any relative motion between the sprocket wheels of the chain, which can therefore be short.

The friction disk is mounted on an extension of the engine shaft, and the friction wheel on a splined cross shaft. At the end of this shaft there is an enclosed spur reduction gear, and thence the power is transmitted to the rear axle by a short chain. No differential is used. The wheelbase is 102 in., the tread 42 in. and the weight is approximately 900 lb.

Service Advertising Is the Need of Day

Largest meeting of Advertising Managers' Council of M. A. M. A. hears notable speakers who urge practical advice in all of their publicity. Start movement for revision of rules governing shows and exhibits.

By Clyde Jennings

AT no period of the well filled program that made for a busy day did the members of the Advertising Managers' Council of the Motor and Accessory Manufacturers' Association escape from the outspoken fact that advertising must be directed more and more toward the service work and that managers must examine more closely the objective and mediums of their advertising campaign. And let it be said, to the credit of the 150 or more men and two women present, that they showed no disposition to escape this service talk. Indeed, their heartiest applause was for the men who talked service most emphatically.

The service talk began at the very beginning. S. E. Baldwin, who called the meeting to order in the place of Chairman E. C. Tibbitts, spoke of the service of the Council to those who attended. Then E. W. Clark read a paper on "Selling the Automotive Industry to America." The speaker went into his subject exhaustively and traced the story of transportation from the beginning, showing how wealth had increased as transportation costs decreased. At this period, he said, we were at another turning point when railway building in this country was almost at a standstill, and that highway building is just beginning. The truck and the passenger car were coming into their own as utility vehicles. The excess of expectation and the purely pleasure use of these vehicles are undergoing adjustment. He advocated that when the spokesmen for the automotive vehicles appear before the Congressional Committee to seek the proper adjustment of taxes, that they openly advocate that automotive vehicles be taxed in proportion to their carrying capacity on par with railroad locomotives and cars. Clark expressed a belief in the need for a greater automotive organization than yet existed, to co-ordinate the work of the present organizations and that on this organization should fall much of the promotion work.

Alfred Reeves, general manager of the National Automobile Chamber of Commerce, reviewed briefly the organization work within the industry and expressed the belief that co-ordination was rapidly being effected. He said that he believed that if any fault was to be found with the advertising of the past it was that the automobile had been over advertised. His thought was that the needs of the past justified the means used, but that now a turning point had come and that more utility advertising was needed. Service was the great need of the day and a part of the advertising of service was to provide the 120,000 mechanics needed for this branch of the industry. He suggested that each advertiser of any automotive product inject into his display space some bit of information regarding the advances of automotive transportation.

C. C. Parlin of the Curtis Publishing Co. reviewed the business situation with an especial reference to what he termed the "retarded sales." His view was that while this country was not now buying as freely as it might, that the greatest stagnation of business was due to the lack of willingness of retail merchants, especially the smaller merchants, to lose some money themselves. Merchants, he said, like every other human being, were entirely willing to see some other person lose money. As a consequence they had been permitting their shelf stocks to dwindle, awaiting the necessity of buying. That period was here, he said.

He viewed the automotive prospects as entirely hopeful. He predicted early sales, but not an avalanche of sales. He reviewed the ownership in homes of several high priced articles—in the community canvassed pianos were in 44 per cent of the homes, autos in 42 per cent and talking machines in 32 per cent. Since that survey was made in 1918, the purchases had been 24 per cent of autos, 22 per cent of talking machines and 4 per cent of pianos. The speaker made the point that pianos were not "advertised." His definition of advertising apparently was space in thirty leading magazines. But he made this point only as to purchases since 1918, ignoring the fact that pianos are well advertised locally and in business papers and had in the canvass a higher percentage of ownership than the nationally advertised articles he referred to.

In a humorously cynical address A. R. Kroh, who introduced himself as a farmer, advised that it was a necessity for every automotive man to advertise his vehicle or part of a vehicle to the farmers in the plainest possible service terms so that the farmer might improve his position and be able to continue raising enough food to keep on feeding the great percentage of people who are non-productive from a food viewpoint. His address was well received and carried home its lesson of the responsibility of advertisers to sell their goods definitely and truthfully.

In his paper on "Cashing In On This Year's Automobile Shows" W. E. Brewster took the position that the show put before the public the spirit of the industry and as long as the public will pay to see the annual exhibition it is the duty of all concerned to participate. He advised a closer check of the visitors, etc. In his discussion of this paper, A. H. Bartsch brought up the subject of revised exhibition rules and was offered much encouragement. As a result, a resolution was passed that the executive committee name a committee to take up with General Manager Heminway the subject of revising the rules for shows, a work that Heminway reported to be already under way, and he welcomed the assistance.

"My Best Advertising Bet for 1921" was a forum participated in by Ralph Leavenworth, Eben Griffiths, Joseph Jacobs and R. E. Mackenzie. Their suggestions were for closer co-operation with the salesmen, better co-ordination of business paper, magazine and mail advertising, better follow-ups and generally for injection of efficiency into the advertising business.

The time and place for holding the quarterly meeting in March was left to the executive committee. The January meeting was held in the college room of the Astor Hotel. The attendance was the largest since the council was formed. Chairman Tibbitts's absence was due to the very serious illness of Mrs. Tibbitts.

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The AUTOMOBILE
Reg. U. S. Pat. Off.

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The New York Show

THE opening three days of the New York Automobile Show have given unmistakable evidences of a potential buying market and also indications of a disintegration of the buyers' strike. While attendance may not quite equal that of a year ago, it is highly encouraging and the percentage of visitors displaying a particular interest is perhaps higher than a year ago. It has been conspicuous that there has been a great amount of interest in high priced jobs and that the percentage of attendance of visitors in exhibit spaces of such cars is greater when compared with the visitors in the exhibits of low-priced cars than formerly. In other words, it might be inferred that the drop in attendance is more with that class looking for low priced jobs than in that class looking for high priced jobs. A natural inference is that the last few months have not taken the buyer of high priced cars out of the market due to any lack of money but that he has been awaiting the developments of the market and, perhaps like many others, has been holding off from buying as long as possible.

The growing conviction that the merchandise shelves of the retail industry of the country are very empty and that they must come into the market is having an echo in the indications of real buying that the show has already given. The great arrival of buyers of textiles from all parts of the country in New York during this week, is a further indication that the buying strike is gradually breaking down. These buyers were in New York City last July and they refused to buy. Some of them came during later months in the fall and they refused to buy. The heavy reductions in many lines of textile prices made on Dec. 31, 1920, are having their effect. There has to be heavy buying in the textile field. This is going to play its part in breaking up the buyers' strike in other lines. It is the entering of the thin edge of the wedge.

The New York Automobile Show has never been a strong retail show. Coming as it does in January, it is too far in advance of the spring season to warrant hasty deductions as to the effect on later buying. There is a greater tendency this year than in former years to conclude that business is not picking up due to few retail sales. In other years when we did not approach the show through a supercharged atmosphere of depression nobody expected much retail business and consequently were not disappointed if it did not come. The results of this year's shows should be interpreted rather through the spectacles of a year ago than through the spectacles of this year.

There is no question as to the interest in the engineering features by those who know motor cars best. The engineers present were quite anxious to see what was on display and the parts manufacturers were free to say that their engineering departments are busier than ever before. All of this indicates that the present design of cars is not to be regarded as by any means fixed. Fortunately, the cessation in production is not permitted to check development. It has in fact given an opportunity for improvements which could not have been made during a period of intensive production. Many improvements known to be in process are not yet exhibited. Next year's show will, for this reason, be apt to contain more that is really new than is to be seen at the current exhibit.

A Change in Brake Practice

IN the past when a transmission brake has been used on American cars it has generally been the pedal operated service brake, while the wheel brakes were the rarely used emergency brakes. The chief object in making the transmission brake the service brake obviously was to render brake operation less onerous to the driver, as the transmission brake requires much less effort to apply than does the ordinary rear wheel brake.

Recently, there has been a complete change in this practice, and the transmission brake is now generally made the emergency brake. This change can be justified on several grounds. The emergency brake is undoubtedly the one which should be used for making emergency stops, that is, quick stops required to avoid collisions or other accidents. Now, the transmission brake is always far more powerful than the

rear wheel brake and therefore far better adapted for making quick stops.

Under ordinary conditions it is not good for a car to be stopped very quickly, and with the rear wheel brakes, which require much more effort to apply, the careless driver is not so apt to misuse his brakes. Moreover, the transmission mechanism is not subjected to the braking strains when the brakes act directly on the rear wheels. Unnecessary strain on the driving members has been the chief argument against the transmission brake in the past, and if the brake is used only for rare emergency stops the objection loses much of its weight. On the other hand it seems to be the reasonable thing to ordinarily use the mild brake and only in case a quick stop is absolutely necessary to resort to the more powerful one. The wear of tires will certainly be much reduced if this plan is followed, as compared with the case when the transmission brake is constantly used.

Stock rear axles usually carry two sets of brakes, and this tends to prevent the adoption of transmission brakes on new cars. However, where the axles are specially designed for a new job there seems to be a decided tendency to adopt the transmission brake, as this obviates the need for the exposed contracting brake on the rear wheels which is hardly in keeping with the modern practice in motor car engineering of enclosing all working parts so they are fully protected from dust and dirt.

Aircraft Development in U. S. During 1920

A SURVEY of aircraft development during the past year does not show startling advances in this country, viewed from a civil or commercial angle. American built and designed aircraft have maintained a high standard of efficiency, however, according to a statement of the Manufacturers' Aircraft Association.

Production of airplanes has greatly decreased and a general contraction of the entire aeronautical industry has been evident during the latter part of 1920.

Several very definite reasons can be noted as cause for the lack of civil and commercial development in this country. Among the chief of these are:

1. Lack of aerial laws.
2. Lack of a sufficient number of properly equipped landing fields.
3. Need for a definitely outlined policy of Federal jurisdiction.

The most important of these lacking provisions is considered by the industry to be the last. It is believed that because no definite Federal policy has been pursued in regard to the advance of civil aviation, we are in our present position, inferior to England and several other nations in this particular respect.

The matter is gaining attention from legislators, however. This is indicated by the fact that the New York State Legislature considered State aircraft legislation, but finally adopted a resolution asking Congress to enact a Federal law before the various States passed conflicting legislation.

American pilots flying American machines, however, have achieved excellent individual performances both in the way of speed, consistency, endurance, and altitude.

The Engineer as a Partner in Business

IT is often said that the engineer is not a good business man. Some executives hold the view that engineers in general are narrow-minded specialists who are either incapable of or unwilling to be guided by factors which must dictate business policy. Certain it is that some engineers are so absorbed in abstract theory and its application, or in making changes in design to improve or bring up to date the product they have in hand, that the effect upon cost and time of production with consequent effect upon marketing, profits, etc., is overlooked.

This tendency is one of which we should not lose sight in this day of specialization. It has often reduced the engineer to a mere employee when, if he had taken a broader view, he would have become a partner in the business, as he properly should. The truly successful engineer is the one who fits himself into his environment—who serves wherever and in whatever way opportunity offers—not the one who rides his own particular hobby or follows the narrow gage single track of a specialty to the exclusion of broader activity.

The engineer must strive to put himself in the position of the executive who must make a business success of the venture. When he takes this broader view, and secures the confidence of the executive he should, and we believe will as a rule, be recognized as a true partner in business. This is but one reason for the plea that engineers who have not already seen the light to cut loose from old fashioned precedent and widen their horizon for their own benefit. We do not advocate departure from engineering ideals worthy of the name, but we do urge upon the engineer the necessity of appreciating the viewpoint of the man who must make the venture pay, lest the whole structure fall, realizing, of course, that no structure can prove permanently effective which is not built on sound engineering principles.

On the other hand, it should not be forgotten that modern business is itself carried forward on engineering principles and that many of the most successful engineers are holding prominent executive positions in which their engineering ability is being utilized to the best possible advantage. Such men as C. F. Kettering, W. H. Van Dervoort, H. E. Coffin, H. M. Leland, H. W. Alden, A. L. Riker, Howard Marmon, K. W. Zimmerschied, J. G. Vincent and many others of like standing have reached positions which indicate that the engineer is not lacking in business ability. Similar success will attend many more engineers in the future if a broader conception of the function of the engineer becomes more prevalent.

Show Illustrates Trade Conditions

Public Not Deterred by Price Situation

No Likelihood of General Revisions—Production Schedules in Formation Stage

NEW YORK, Jan. 10—Prospective purchasers of motor cars apparently are less interested in the subject of prices than they are in quality, workmanship and satisfactory service. Salesmen at the show are not often called upon to undergo heckling about how much their cars cost or what the prospects are for reductions. It is becoming apparent that with the general downward trend of prices for the commodities which make up the everyday budget, persons who own motor cars and who hope to own them will not be deterred from purchasing the car they want by a few dollars more or less.

As a matter of fact, factory representatives and dealers appear to be more interested in prices than do the public. The expectation had become more or less general in the trade that drastic changes downward would be announced at the opening of the show. This belief was not well founded. Quite a number of price changes were announced but there were fully as many which moved up as there were down. In cases where price schedules were raised, they generally were accompanied by new models or by refinements in the old models which made them more attractive and which justify the additional cost to the purchaser. Companies which guaranteed their prices are standing pat and in several cases the belief is expressed that the guarantees will be extended. In a few instances however, it is expected reductions will be announced when the guarantees expire.

Production 25 Per Cent

Except in a few instances, officers of manufacturing companies who are here for the show, make no attempt to gloss over the situation. They admit frankly that production at this time is virtually nil and that they are not being overwhelmed with orders. There are heard only a few glowing accounts of factories running in full blast and purchasers falling over each other to get cars. The average production in the industry at this time does not exceed 25 per cent and the chances are it is less than that. Fully a quarter of a million workers in passenger car plants are out of work. Most factories however, have resumed production on a much reduced scale or contemplate doing so in the near future.

In spite of the absence of actual orders, there is manifest everywhere a feeling of confidence in the future. This is not expressed in extravagant claims, but it shines through all the statements of present conditions. The sales manager of nearly every well known company is here, and they say frankly that business is slow at present but they are unanimous in the assertion that a greater willingness on the part of the public to purchase is reported by their dealers in nearly every section of the country. They are agreed that the buyers' strike is being broken gradually.

There is no expectation that there will be a big boom in business the first quarter of the year. As a matter of fact, most manufacturers will be well satisfied if they do as much business in the first half of 1921 as they did in the last six months of 1920. It is the general expectation that something like normal will be restored by April 1. All efforts to obtain tentative production schedules for the year are futile. Factories expect to be guided by the results of the New York show.

Production Matter of Sales

Production schedules in factories, large or small, whether located in the Detroit zone or out in the "sticks" depend entirely upon developments in the next few weeks, and to a considerable extent, on buying tendencies evinced at the show here. Not a factory representative at the New York exhibit could proclaim anything definite in the line of a schedule as the show opened.

Sales managers were a unit in the opinion that production for some time would be entirely on a sales basis. This was emphasized particularly in the higher priced cars.

Considerable apprehension was expressed of a too sudden development of business which would catch the factories unprepared to go into capacity production and which might cause another ascent in prices. With the results of the show here analyzed, however, the factory executives hope to be able to prepare themselves for early spring developments and meet business without undue delays in deliveries.

No Stocks in Salesrooms

Few dealers are stocked to any extent to meet a sudden spring onset of business, the factory men declared, this condition being particularly acute in the Middle West and agricultural districts of the country where credits required to carry winter stocks had been withdrawn with the agricultural and transportation crisis of the past summer.

This condition, sales heads were agreed, is likely to bring upon the factories the necessity of getting six months normal production rushed through in three months. To forestall this, the developments of the show and the general attitude of the public will be scrutinized

(*Continued on page* 90)

PRICE REVISIONS AND PRICES ON NEW MODELS IN EFFECT AT NEW YORK SHOW

REDUCTIONS

Peerless	4-pass. $3230 to $2990; roadsters $3200 to $2990.
Jackson	$200 on all models except new 4-pass.
Auburn	$200 on all models.
Davis	$200 to $290 on open cars; $390 on enclosed.

INCREASES

Franklin	$100 on open cars, Jan. 1; $100 on enclosed cars, Jan. 15.
Dort	$130 on new touring and roadster models.
Velie	$325 on new model 48 Sedan at once; $100 on new model 34 Touring, Feb. 15.
Moon	$200, Model 6-68, $2685; 6-48, $2185; enclosed, $3185. (Moon previously cut $400)

NEW MODELS

Saxon-Duplex	$1675 on open models; $2475 on enclosed. This represents a reduction of $220 on former open models, and $320 on former enclosed.
Columbia	5-pass. Touring, $1995; coupe, $2895.
Haynes	5-pass. Touring, $1985.
Mitchell	5-pass. Touring, $1995.
Maibohm	Coupe, $2395.
Detroit-Electric	Brougham, $4000.
Pilot	5-pass. touring $2285.

An increase of $200 was practically effected by Dorris through elimination of extra equipment, though refinements were added in construction.

Enthusiasm Kills Sales Resistance

Distributers Place Contracts for Cars

Evidences of Good Retail Business Also Seen to Keep Production Even

NEW YORK, Jan. 12—Assuming for the sake of argument that all factory sales managers are prevaricators and discounting their statements by half, the tide has turned in the passenger car field and the sales resistance offered by the public is slowly but surely crumbling.

The New York show is bringing business not only at retail but from dealers and distributers. There is substantial evidence that dealers are placing orders without strings on them and fixing shipping dates. One surprising feature of the exposition is the large number of dealers and distributers who are sticking close to the exhibits of their chosen line and thereby feeling the public pulse.

As the show has progressed, uncertainty has given way to hope and hope to confidence. The faces of men in all branches of the industry who have gathered here in large numbers from all parts of the country are wreathed in smiles. When they started to New York they seemed more or less dubious as to what the actual results of the show would be but when they saw the crowd on the opening day, they became hopeful and as the throngs around the exhibits have steadily increased in size, they have become confident.

Confidence Becomes General

The feeling of confidence is shared not only by passenger car manufacturers, but by parts makers, tire manufacturers, distributers, dealers and salesmen. The people attending the show are not idle curiosity seekers, but a large proportion of them actually intend to buy cars. This is evidenced by the careful way in which they do their shopping and by the intelligent questions they ask. It is apparent that the manufacturers of expensive and medium priced cars will do fully as good a business in proportion to their normal production as those who make the lower priced vehicles.

Factory sales managers and their assistants are not sitting in easy chairs in hotel rooms waiting for dealers to call upon them, unless it is to keep appointments, but are working with the salesmen at the exposition. The statements they make are not roseate and they do not appear to be exaggerated. There is no attempt to give the impression that factories will be running full blast in a few weeks, but it is plain the men who sell the factory output are greatly encouraged over the outlook.

They are unanimous in the assertion that the business which the show is bringing is much better than they anticipated. They refuse to make predictions as to production schedules for 1921 and they do not expect the business for the year to equal that of 1920, but they are confident the year will bring a normal trade.

No More Overproduction

It is safe to say that from now on there will be no over-production of passenger cars. Factory heads are determined to produce only enough to meet the actual needs of dealers and there is no intention of renting warehouses to store cars for which there is no immediate demand. One company reports that it already has on hand orders for approximately 15 per cent of the cars it expects to make this year.

All the sales managers say the majority of their dealers have ceased to shake their heads in discouragement and that they are vastly more hopeful about a satisfactory spring business than they were even a fortnight ago. The New York show has proved its value and it probably is doing more to aid the industry than any exposition previously held.

MILES SMILES

S. A. Miles, veteran manager of the N. A. C. C. shows, is chuckling over the success which is attending the New York exposition this year. He was confident that there would be a satisfactory attendance but the interest on the part of the public has exceeded his expectations and he believes a substantial number of actual sales will result from the show.

Southern Reserve Sees Improvements in Outlook

ATLANTA, Jan. 10—Reports received by the Federal Reserve Bank of Atlanta from various parts of the sixth district, which comprises nearly all of the Southeastern area, indicate an improved outlook for the beginning of the new year, and portend a return to normalcy, in the opinion of M. B. Wellborn, governor of the bank. Business and industry in general throughout the Southeast is beginning to resume activity, Wellborn stated.

He further stated that he believed business was becoming gradually more stable and that the outlook for the future indicated a return to normal during the next few months.

Factory Executives Assume Active Roles

Many in Attendance at Opening of Show to Push Business—Service Men Active

NEW YORK, Jan. 10—Seldom have there been so many factory representatives at a show as are here this year, especially for the opening. It is significant of the trend in the industry that several service managers have stationed themselves at the exhibits of their companies to answer questions and see that nothing goes wrong with the cars displayed. Engineering departments also are well represented. The salesmen on duty are in most instances under the watchful eyes of factory sales managers. This is a business show and the men from the factories are sticking on the job. They have come for work and not for amusement. Here are some of the factory representatives who arrived for the opening of the show:

Hupmobile—Charles D. Hastings, president; O. C. Hutchinson, general sales manager; Frederick Dickinson, advertising manager; C. E. Salisbury, service manager.

Cole—President J. J. Cole; H. R. Hyman, advertising manager.

Nordyke-Marmon—President W. C. Marmon; H. C. Marmon, vice-president; F. E. Moskovics, vice-president; H. H. Brooks, assistant sales manager, A. J. Rogers, advertising manager.

Jordan—President E. S. Jordan; R. S. Begg, chief engineer; Paul Zens, secretary; W. B. Riley, sales manager; S. R. Thomas, assistant chief engineer; J. H. Kelley, factory manager; R. A. O'Reilly, foreign sales manager.

Packard—President Alvan Macauley; J. G. Vincent, vice-president; R. E. Chamberlain, assistant general manager; H. T. Gardner, carriage sales manager.

Franklin—President H. H. Franklin; G. R. Taxada, engineering department.

Oldsmobile—President Edward Ver Linden; Leon R. German, vice-president; Charles A. Tucker, general sales manager; Guy A. Peasley, assistant sales manager; Thomas O'Brien, manager sales promotion; R. K. Jack, chief engineer.

Dort—President J. D. Dort; D. M. Averill, vice-president; John D. Mansfield, general sales manager; H. S. Daniels, advertising manager; F. A. Petrie, assistant sales manager.

Velie—F. E. Bradfield, vice-president and manager; H. T. Wheelock, advertising manager; L. E. McKie, sales representative.

Columbia—President J. G. Bayerline; A. T. O'Connor, secretary-treasurer; W. L. Daly, sales manager; Charles E. Pelton, supervisor of agencies; George C. Gurney, service manager; William C. Hunt, advertising manager.

Auburn—President M. Eckhart; A. P. Kemp, vice-president; J. I. Farley, sales manager; A. M. Graffis, chief engineer; A. R. Johnson, assistant sales manager.

Haynes—Gilbert U. Radoye, director of advertising and sales promotion.

Peerless—R. J. Schmunck, general sales manager; W. W. Lewis, assistant sales manager; C. Sterling Bailey, advertising manager; W. W. Mitchell, Southern representative.

Dorris—President G. P. Dorris.

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LIVE NOTES OF INTEREST AT NEW YORK SHOW

TWO avenues of progress are open before the industry according to a merchandising expert who has studied it. First, he stated, there is need of greater capitalization. Too many factories, he declared are under-capitalized.

The second need, he asserted, is for real, active, studious, working sales managers who can do something besides write contracts and ship cars. He said we must revise the industry in this important point. He said a company which he represents is now looking for a $25,000 sales manager—and hasn't found him yet. And he added that men like Normal A. Hawkins and other eminent sales executives would be found back in key positions in big organizations inside of a few months.

The Holmes Automobile Co., Canton, Ohio, is producing five of its aircooled cars daily. It has cut the wages of its employees from 5 to 10 per cent. Prices are guaranteed until July 1.

The Kline Car Corp., Richmond, is at 60 per cent production. No reduction in wages has been made. Prices are guaranteed until June 1.

The Saxon company expects to announce its production schedules for the year by February 1. It is now making five cars a day. When the factory really gets into operation, it is probable a wage cut of 20 per cent will be made.

The plant of the Kentucky Wagon Mfg. Co. which makes the Dixie Flyer is practically closed and no wage cuts have been made as yet. Prices have been guaranteed to May 1.

The LaFayette factory at Indianapolis is said to be producing cars at the usual rate and no wage reductions have been made. The company has not guaranteed prices but expects to make no changes in the near future.

General Sales Manager J. W. Connor of Pilot said contracts had been signed by him for half of the anticipated output of 2500 cars for the year. The company is making a higher priced model than ever before, a five-passenger touring car, and is finding sales generally satisfactory. Slight wage cuts have been made and inefficient workmen weeded out. H. E. Walker has been added to the personnel as assistant sales manager.

MAKERS of the Stanley steam car expect to increase prices in the next few months unless reductions in parts prices and materials are made. These were contemplated when reductions were made recently in prices but as yet they have not been realized. Wages at the factory are to be reduced and the full force of employees kept working unless the employees decide upon a short work week at present wages.

Apperson factory representatives sensed a continuance of sales resistance until possibly April 1, and in the interval until then thought several manufacturers might be compelled to go out of business. Production at Apperson factory was strictly on a to-order basis and would not be increased until it was evident that sales resistance had been overcome. Wages were lower, they said.

General Sales Manager T. L. Marshall of Stutz said his company would be in a position to outline production after the New York show. The show should be a big factor, he said, in showing just how much sales resistance had lessened. Wages at the Stutz factory, and in fact in all Indianapolis factories, was practically on the same level as formerly, the companies having found it impossible to maintain efficiency of workmen at lessened wage.

Cadillac swung into production Monday, but no information could be secured as to the production schedule or the number of men employed. Prior to the shutdown for the holidays, Cadillac was building on a schedule of around 2000 cars a month with a force of more than 2000. It is known, however, that Cadillac had a large surplus, and unofficially it is stated production will be held down to about 25 cars a day for the time being.

Packard still is operating about 50 per cent of its force with a production schedule around 25 daily, chiefly the new single Six.

MANUFACTURERS of enclosed bodies, say their business has suffered because of the open winter. In one cold week one company sold 50 bodies and the next week when the weather was mild again, practically none was sold. As a result of this condition, dealers are cutting prices to unload their stock.

Locomobile and Mercer, the Hare's Motors cars, are being produced only on a sales basis. Wages are at the same level but factory efficiency has been increased. No price revisions are under consideration.

Sayers & Scoville Co., maker of the Sayers car, finds its production fairly stable owing to its specialization in cars for commercial purposes, such as motorized funeral equipment, ambulances and work requiring special bodies. Demand for this work is setting in very strong in New England and the East generally. Wages are on practically the same level as previously to maintain efficiency. No hesitancy would be exhibited by the company in increasing prices, General Manager Hess said, if it were thought necessary to maintain standards.

The Oakland distributers in New York report the best pre-show week business in their history. Prior to that time, sales were practically dead.

The Cole company expects its business for the first half of 1921 to equal the last half of 1920 and that the second six months of this year will be still better. Shipments are being made only to fill actual orders. Prices have been guaranteed to April 1. No action has been taken as yet on wage reduction.

The Nordyke-Marmon Co. is operating on a 25 per cent production basis. No price changes have been made and nothing has been done in cutting wages. H. H. Rice, sales manager, will return this week from a six weeks tour of Europe where he has been establishing agencies.

ORDERS in the past ten days have brightened appreciably, representatives of most factories declared, many coming in the nature of surprises. A new dealer signed by the American in the Minneapolis district has ordered a car-load shipment for immediate delivery when no orders had been expected from him before spring.

The Jordan company is producing at the rate of 35 per cent of normal. Business in December was better than either in November or October and a further increase is expected this month. Slight wage reductions have been made in the factory.

A reduction of 10 per cent has been made in wages paid employees in the Maxwell service stations in the Metropolitan district.

The Dorris Co. expects this year to equal its 1920 production. No wage reduction has been made in the factory because it is the purpose of the company to use only the highest class workmen in producing its cars. The price of the car has been guaranteed and there has been an increase of practically $200 in the price to the consumer by the elimination of spare parts in the standard equipment although this has been invested by the company in superior materials.

The McFarlan Motor Co. is said to be in full production. Prices have been guaranteed to May 1. There has been no readjustment as yet in factory wage scale.

The estimated production of the Hatfield car for 1921 is from 500 to 600. The factory now is closed.

Production of the Pan-American car at present is at low ebb, but more orders are being received. Wages have been reduced from 10 to 20 per cent. Prices have been guaranteed to July 1.

The price guarantee on Noma cars probably will be extended from March 1 to July 1. Production this year is expected to reach 300. An average reduction of 10 cents an hour in wages has been made in the factory.

CHARLES A. VERLIN, eastern representative of the Hanson company, said its record of price maintenance without change for six years will not be sullied now. Sufficient material is on hand to make 1500 cars, he said. Though production is now only at the rate of four or five a day to meet sales, this could be increased immediately to capacity.

Maxwell-Chalmers dealers have been greatly cheered by an announcement that the reorganization plan which provides for a consolidation of the two companies has been declared effective and that details of the proposed new management probably will be announced in a few days.

PUBLIC INTEREST BRIGHTENS BUSINESS PROSPECT

W. E. Metzger, vice-president of Columbia Motors and a director of the National Automobile Chamber of Commerce, reports there has been a very marked improvement in the feeling of Detroit manufacturers in the past fortnight. They expect a steady increase in business from now on, but they have no idea that the upward trend will be rapid. In Metzger's opinion, the used car problem is one of the most serious which confronts the industry at this time, and he believes that all dealers would do well to follow the example of those in Detroit and clean out their used cars regardless of their losses, so that the decks can be cleared for new business.

The Oldsmobile plant is producing 35 cars a day. A reduced factory force is working at a nine hour schedule. Wages were reduced two weeks ago.

H. G. Wilson, Detroit distributer for the Auburn line, last week drove 25 cars away from the factory.

The new Navarre six cylinder model is on display at the show. Prices for it have not been announced yet.

WILLIAM SMALL CO., manufacturer of the Monroe, received orders for 18 cars last week from Indianapolis purchasers. The parts department of the company has been kept in continuous operation. The outlook for the future is so encouraging it is hoped that it will be possible to lift the receivership in the near future.

The Dort factory is practically dead in production at present because it is changing over from its old to its new models which are being shown here for the first time. It already has received a substantial number of orders for these cars and they will be placed on the market Jan. 20. When the factory gets into operation, wage readjustment will be made.

R. E. Olds, president of the Reo Motor Car Co., is a sane optimist regarding the future. He feels that his company is producing cars at a rate as nearly normal as any passenger car concern, and he expects a steady improvement in business, although he does not look for any sudden jump. As a matter of fact, he believes a normal spring business will develop after the show, but he has no expectation that it will be abnormal as it was last spring, nor does he think the 1921 sales will be as large as those in 1920. His expectations regarding the future are based upon his own observations and the views of his distributers.

Pat Emerson, assistant sales manager of Reo, who is in charge of sales of the "speed wagon," says the world looks a lot better than it did two or three weeks ago. As proof of his assertion he tells of Henry Adams, his dealer at Fostoria, Ohio, who is driving 150 vehicles away from the factory this week. December, in his opinion, marked the darkest hours for the industry. The commercial vehicle end of the Reo business has been good all through the period of depression, however, and the factory is running full

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HUPP Motor Car Corp., which has been on a schedule of 35 cars a day since Dec. 1, now is building 50 cars with a slight increase in the working force, and will continue that schedule throughout this month. Good reports on prospects are being received from Hupp dealers, justifying the 15 per day increase in the present production schedule. Hupp has about 800 men working.

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blast, giving employment to 5000 men. Emerson has sold cars right along but he says the secret of his success has been hard work and constant plugging with not enough hours in the day to do all he has wanted to accomplish.

The plant of the Elgin Motor Car Co. is running at about 65% of capacity, thanks to a very large export order given by Gaston, Williams & Wigmore. Its own export business is holding up remarkably well and representatives of the company at the show say that they have had many inquiries from exporters who ship cars to Sweden, Denmark, England and India.

The drill department of the Clark Equipment Co. is working full time, while every department is operating to some extent on a four-day a week basis. Taken altogether, the entire plant is working about one-half normal capacity, according to E. W. Clark, advertising manager of the concern.

Wages are controlled by the workmen and have not been reduced. Questioned as to whether a cut was likely, Clark said that future conditions would naturally govern, but expressed confidence that having raised wages in the plant, employees would reduce them again when conditions and necessity warranted a cut.

Continental Motors officials are meeting this afternoon to discuss production plans, and from the meeting information was given out that 2500 men would be put to work tomorrow in the Detroit plant.

Paige, which began taking on men last week preparatory to getting into production, had between 800 and 1000 men working, with a production schedule of 25 cars a day. Orders on the books and reports from dealers, according to production officials, justify announcement of a schedule increase of 10 cars a day next week, with a complete increase in working force, and two weeks from today the schedule will be increased to 45 a day.

DU PONT is making two and three cars a day at the new Moore, Pa., plant and is ready to go ahead at full speed as soon as conditions require. E. P. du Pont, president of the company, has taken the general managership of the company under his direction for the time being, A. M. Marris, former general manager, having resigned. Wages are lower than formerly and labor efficiency is at a high point.

Liberty Motor Car Co. will resume next Monday with several hundred on a schedule that will approximate around 375 cars a month. Liberty reports splendid information from the dealers' field in the last two weeks, and officials at the plant feel confident that the production schedule will be increased steadily until late spring, when it is believed the factory will be on a basis of pre-war normal conditions. Liberty, while the plant has not been down completely, practically has been producing no cars for some time, and the plant's resumption next Monday will permit of increased operations by the Motor Products Corp., Timken-Detroit Axle Co., the Michigan Stamping & Tool Co. and other parts makers affected by the Liberty recession.

Scripps-Booth is operating with about 250 men building closed cars, chiefly on a schedule of a bout 20 per cent of the normal conditions, or approximately 250 cars a month. This schedule will be increased to 25 per cent later this month, and by Feb. 1 it is hoped to have the factory running on a 50 per cent basis, with a full production schedule March 1. Scripps dealers, according to Pres. Sarver, feel that the bottom has been reached, and they are now moving upward with prospects for gradual steady improvement in demand. The actual orders on hand and the reports on prospects from dealers are the basis on which the present production schedules have been outlined, and orders to parts makers in line with the schedules fixed have been sent out.

Both Maxwell and Chalmers plants began building cars today on a schedule of 25 of each type of car in each plant daily. About 375 men are at work in the Maxwell-Chalmers plants. It is the plan of the officials to increase this schedule beginning Feb. 1.

STUDEBAKER opened its second unit in Detroit Monday simultaneously with the opening of the factory at South Bend. With full resumption today, Studebaker starts a schedule of 90 cars in South Bend and Detroit, about 1100 men returning to work at the Studebaker Detroit plants today, which added to the 400 who returned to work in plant 5 last Monday gives a force of 1500.

Oakland Motor Car Co., which had planned to reach a production of 100 cars a day, still is behind that schedule, according to W. H. Maston, assistant general manager, who declined to say exactly what the daily output is. He intimated, however, it was around 75 cars a day, and said the factory was employing about 33⅓ per cent of the regular working force. The present output, Maston said, would be maintained until the demand justified an increase.

Buick resumed production today and will build about 250 cars daily until the demand justifies an increase in the schedule.

Chevrolet, which resumed production last week, now is operating on a schedule of 100 a day.

Public Not Deterred by Price Situation

Absence of Stock Cars May Cause Heavy Spring Demand—Parts Reduced

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closely in an attempt to meet the demand at all times with instant deliveries.

Manufacturers of essential parts here for the exposition, are somewhat perturbed over their inability to get estimates of car production schedules. They say that thus far manufacturers of complete vehicles have been unable to give them any idea of the number of cars they will purchase. For that reason the parts men have been unable to make contracts for supplies of raw materials. But they are hopeful of getting some figures which will be helpful within the next two or three weeks. They are agreed however, that the general tone of the market is better and say that some orders are being placed. Most of the parts factories which have been down have reopened on a much reduced schedule or are preparing to do so.

The downward trend of prices in the parts field is more marked than in the passenger car end and numerous reductions have been announced.

Of fifty-two representative accessory exhibitors, thirty-seven, including some of the larger companies, stated that they had not made any reduction in their prices. Of the remaining fifteen, twelve exhibitors announced reduction in prices as follows:

C. Cowles	10-40	percent
Light Mfg. & Foundry Co.	20	"
Prestolite Co	20-22	"
Wm. Cramp & Sons	20	"
U. S. E. Corp	40	"
Luthy Storage Battery Co.	20	"
Consolidated Utilities Corp.	20-25	"
Breeze Metal Hose & Mfg. Co.	25-33-⅓	"
Willard Storage Battery Co	20	"
Doehler Die Casting Co.	15	"
Superior Lamp Mfg. Co.	15	"
Gemco Mfg. Co	15	"

The remaining three exhibitors had nothing to say about prices.

These figures show that a reduction in prices has begun. This is particularly true in the case of concerns manufacturing castings, etc., rather than assembled jobs, but the twelve price reductions out of fifty-two is probably not representative of general conditions, a much larger percentage of reduction being probable in the near future.

As regards present factory production the greater number of exhibitors stated their production to be anywhere from ten per cent up to fifty per cent of capacity; 33-1/3 per cent would be a fair average figure for all the exhibitors questioned.

Out of fifty-two representative exhibitors only three the Giant Grip Co., the Sun Co., and the Biflex Products Co. announced their factories as working at full capacity production. But the number of companies whose present production is down to thirty, forty or fifty per cent stated the probability and in some cases the certainty that their factories would be working to full capacity by March of the present year.

Wages on Lower Basis

The question of wages is uppermost in the minds of nearly all the manufacturers. Factories which are operated on a production basis of even 20 or 25 per cent, already have reduced the pay of their workers from 5 to 20 per cent. In nearly every case, these cuts have been accepted willingly and the men at work have shown much greater efficiency than they did at higher wages.

It is apparent that the factory hands realize that their pay must be scaled down along with the cost of living to them. Most operators of factories which have not yet resumed production say that when their plants reopen, there will be wage cuts. There are a few notable exceptions to this rule, notably Franklin and Columbia which say they will not cut factory wage schedules until they are forced to do so.

The same stand is taken by a few other car makers whose plants are located in small towns or who produce high quality cars which they say they cannot afford to entrust to any but the most skilled workmen.

While wage cuts have not been so general in garages and service stations, the downward tendency is apparent also in this field and several instances have been reported of reductions. Here also there are reports of greater efficiency and as much work is being turned out by a reduced force.

Credit Situation Remains

Both manufacturers and dealers report little actual change as yet in the credit situation. They are hopeful however of easier money conditions in the near future and appear little concerned over the possibility of financing the business they expect to get. Manufacturers whose plants are located in the south do not expect any great improvement in the industrial conditions there until the next crop is harvested. They say that there is no real shortage of money, but that cotton, rice and sugar growers who have suffered from the slump in the value of their products feel poor whether they actually are or not. The same conditions prevail in the other great agricultural districts of the country.

Taken all in all, the keynote of the New York show is optimism. Manufacturers and dealers came here hopeful that the public would display an increased and serious interest in motor cars and they have not been disappointed. The attendance is fully as large as was expected and there is apparent an actual determination to buy cars either in the near future or as soon as spring weather comes.

Trailer Association Makes Year's Plans

J. H. Fertig Again Chosen President—Initiation Fees and Dues Doubled—Favor Show

NEW YORK, Jan. 10—Two new officers and members of the executive committee were elected by the Trailer Manufacturers' Association of America, at the annual meeting, Jan. 6 in the offices of the Association, Grand Central Palace.

J. H. Fertig, of Newark, N. Y., president, and H. C. Fruehauf, of Detroit, first vice-president, were re-elected. Max Herrmann, of Beloit, Wis., was elected second vice-president to succeed C. H. Martin, of Springfield, Mass., and Henry M. Wood, of Cincinnati, was elected secretary-treasurer to succeed J. C. Endebrock, of Cincinnati. Herrmann and Wood were also elected to serve on the executive committee.

An amendment to the by-laws was adopted doubling the initiation fee and annual dues. A code of ethics in trade practices was also adopted as an amendment, as a preventive against the creeping into the industry of any objectionable methods that might lead to lack of harmony within the organization.

The patents committee was enlarged by appointment of W. E. Ferris, of Cleveland, and I. S. Byrum, of Troy, O., to serve with C. H. Martin, of Springfield; J. W. Menhall, of Edgerton, Wis., and Max Herrmann, of Beloit, Wis. The committee was instructed to make a study of the patent situation and strive to find some plan whereby litigation between members may be avoided, thereby promoting harmony and conserving energies and resources of members which can better be expended in developing the manufacture and sale of trailers.

The standardization committee was continued, with instructions to pursue its investigations and make recommendations to the next members' meeting for standardization of trailer axles and trailer hitches.

A number of members expressed a desire to participate in a national outdoor exhibition and demonstration of motor trucks, trailers, and material handling machinery in event that plans for the promotion of such an event begin to take shape in the motor vehicle industry.

FRANKLIN STOCKS CLEARED

SYRACUSE, Jan. 10—A letter sent to stockholders by the H. H. Franklin Mfg. Co. states that 1041 cars were sold and shipped last month as compared with 826 in December, 1919. Finished cars on hand at the factory on Sept. 1 numbered 544 but none were on hand Jan. 1. The production in December was at the rate of 33 cars a day while the average for the ten months ending Aug. 1 was 39. Reports to the factory show that dealers are not stocking cars but are selling them as fast as they are received.

Rubber Association to Widen Activities

Directors to Act on Proposed Export Department—Dunn New President

NEW YORK, Jan. 11—Harry T. Dunn, president of the Fisk Rubber Co., was elected president of the Rubber Association of America at the annual meeting of the directors here. He succeeds Homer E. Sawyer of the U. S. Rubber Co., who has served two terms. The other officers chosen were: First Vice-President, F. A. Seiberling, president of the Goodyear Tire & Rubber Co.; second vice-president, Horace DeLisser, chairman of the board of the Ajax Rubber Co.; secretary and general manager, A. L. Viles; treasurer, William C. Cox. Prior to the meeting of the directors the organization elected five directors who were: Seiberling, Dunn, DeLisser, William O'Neill, vice-president of the General Tire & Rubber Co., and F. R. Henderson, president of F. R. Henderson Rubber Co., dealers in crude rubber.

The association referred to the directors the power to act on the recommendation of the general manager that an export department and a publicity department should be added to the activities of the association. This question will be considered by the directors at the meeting on Jan. 18, but it is not probable final action will be taken at that time. In his report Viles said:

"We believe that sufficient experience has been had with the potential advantage in Association work to prove the wisdom of attempting to cover the field more comprehensively and efficiently, and that our organization and activities should be extended to a degree which will make the Association a more efficient and competent piece of commercial machinery.

Educational Work Important

"If the export department is established, as it undoubtedly will be, it will help to solve problems in connection with the tire industry in foreign markets, notable among which will be educational work in the interest of the straight side type of tire equipment as contrasted with the clincher type which is being vigorously promoted by the manufacturers in Europe. The publicity or educational department will devote its efforts to the preparation and dissemination of the right kind of publicity concerning the rubber industry in general."

Another proposal made by Viles was that the subject of cost accounting be turned over to an accounting committee and a department organized in charge of an assistant experienced in stock accounting work for industrial groups. It is believed this will be of great value.

The general manager paid tribute to the work of the industrial relations executive committee and proposed that it be made a department of the association in charge of an assistant who would devote most of his attention to the preparation of accurate and timely information concerning employment conditions in various parts of the country. He also urged that additional help be provided to promote broader work along research and statistical lines.

The annual dinner of the association was held last night in the grand ballroom of the Waldorf Astoria and approximately 875 representatives of all branches of the industry were present. The attendance was considered remarkable in view of the industrial conditions which now prevail. Homer E. Sawyer, the retiring president, presided as toastmaster, and the speakers were P. E. Blondin, Postmaster General of Canada; Representative Simeon D. Fess of Ohio and Rev. Nehemiah Boynton. The dinner committee was composed of Horace DeLisser, A. W. Warren and C. W. McLaughlin.

A. B. Jones Resigns Goodrich Committee

AKRON, Jan. 10—Alfred B. Jones, vice-president and director of plant administration of the B. F. Goodrich Co. has resigned from the executive committee, the governing body of the company composed of acting vice-presidents. The resignation became effective Jan. 8. Jones' only comment upon the report current among Goodrich officials that his resignation as vice-president would be acted upon at the next meeting of directors, was to the effect that he still was an officer of the Goodrich company.

Jones returned Monday, Jan. 3, from a six months' European tour during which he made an exhaustive survey of business conditions in many foreign countries. During his absence several changes in personnel in the engineering and administration departments of the Goodrich company were made, George W. Perks resigning as director of engineering, to be succeeded by S. B. Robertson.

Jones formerly was connected with the Diamond Rubber Co. and joined Goodrich upon consolidation of the two companies in 1902. He was elected vice-president two years ago. During the war Jones gained a leave of absence and served abroad for nearly a year as American Red Cross commissioner in France.

BIDDLE ASSETS $172,063

NEW YORK, Jan. 11—Schedules in bankruptcy filed by the Biddle Motor Car Co., Inc., show assets of $172,063 and liabilities of $333,563. Among the creditors are the United States, sales tax on automobiles and parts, $4,672; Forbes-Perkins Co., Boston, $22,000, and W. H. Lippincott, $12,338. Main items among the assets are stock, $149,719; accounts, $21,312, and notes, $750.

ROLLS STARTS PRODUCTION

SPRINGFIELD, MASS., Jan. 7—The American works of the Rolls-Royce company has reopened here on a full production schedule. About 600 workers are employed and more will be added.

Truck Sales Heads Confer on Problems

Gradual Improvement in Business Continues—Used Trucks Prove Stumbling Block

NEW YORK, Jan. 12—Directors of the National Motor Truck Sales Managers' Association met here to-day to consider some of the more important problems confronting their branch of the industry. The session was a continuation of an earlier one held last Friday. The sales managers think there has been some stimulation in sales and they expect a gradual improvement in business. Some of them assert that the gain will be more pronounced than in the passenger car field. Among the companies which report somewhat better trade are Federal, Sterling, Selden, Packard and Republic.

The accumulation of used vehicles on the market is one of the greatest stumbling blocks in the way of renewed activity in the truck market. One of the main subjects considered by the sales managers at the meetings here has been the perfection of some practical plan for meeting this situation. They are approaching the subject cautiously, however, and are not disposed to make any announcement of what they propose to do until they are convinced the proposal will be workable and will result in clearing dealers floors of used trucks. It can be said that conferences have been held here with representatives of the larger finance companies whose co-operation has been marked.

The sales managers also are perfecting plans for bringing about a closer relationship between the manufacturers and the distributers. It is felt they have been working in the past at cross purposes and that this evil should be eliminated. The manufacturers are eager to do everything in their power to aid their dealers. They are striving to eradicate so far as possible the ills resulting from the sale of trucks to anyone who can be dragged in to the sales room regardless of whether he is in a position to pay for the vehicle or whether he has any real need for it.

Would Organize Dealers

Secretary Babney of the Association, is co-operating with the National Automobile Dealers' Association in an attempt to enlist a much larger representation of truck dealers in the latter organization. He believes that if there were a truck division in the N. A. D. A. an opportunity would be presented for the discussion and solution of problems common to all truck distributers.

The sales managers are considerably perturbed over the announcement that the Slough Trading Co. of London proposed to sell in this country 4000 motor trucks made by American companies but left in England by the American Expeditionary Forces.

Fuel Exports Ban Favored in Senate

Members From Agricultural States Fear Shortage for Farms —Want Lower Prices

WASHINGTON, Jan. 7 — Senators from agricultural States, particularly where motorized equipment is used extensively, have announced their intention to support the McKellar bill, which would prohibit exports of petroleum to countries declining to permit American oil producers to own or acquire oil lands. Senator Gronna of North Dakota advised the Senate that restrictions must be placed on exports of gasoline because it is impossible for farmers to operate tractors and other essential automotive farm equipment because of the high prices of fuel.

In advocating the McKellar measure, Senator Gronna declared that "the cost of gasoline affects not only the farmer but it affects the manufacturer of tractors." He pointed out that unless gasoline prices drop, farmers in North Dakota and other neighboring States would be compelled to use horses or mules to operate their farms. Senator McKellar stated that Great Britain is getting more than 50 per cent of the oil supply from this country and at the same time acquiring vast oil fields.

The bill, Senator McKellar told AUTOMOTIVE INDUSTRIES, was not inspired by the resolutions of the American Petroleum Institute which convened here in November. The Senator claimed that it was based on his personal studies and was not sponsored by American producers. He favors reciprocal agreements on oil. It was his inquiry into England's failure to pay past-due interest on loans that led to this legislation, he said. The drastic measure was provoked by payment of vast sums for oil fields and neglect to retire the debt to America. The bill is now in committee.

British Dealers Hit By Higher Plate Tax

LONDON, Dec. 14 (Special Correspondence)—One of the most objectionable terms in the Ministry of Transport's Bill now before the Lower House of the legislature is the raising of the trade license tax from about $16 to $50 a number plate. At first the rate was to be $75 per plate but this has been reduced to $50 as a sort of compromise with the trade. Even at the amended rate the tax will press heavily on dealers as well as manufacturers, because it is not a case of one plate being required, but as many plates at the same rate as the dealer or maker finds necessary for his business.

Ford dealers are expected to be worse hit by this revised tax, because all Fords are invoiced ex-factory at Manchester, where the dealers largely receive them and deliver them by road.

CONGRESS ESTABLISHES CARS AS NECESSITIES

WASHINGTON, Jan. 10—Essentiality of the passenger car is again established. Congressman James Mann of Illinois, leader of the majority of the House of Representatives testified to this fact so convincingly that opposition to appropriations for automobiles for departmental use, faded. "The automobile," says the Congressional chief, "is as much a necessity today for convenience and transaction of business as the street car is in a big city."

Congressman Mann called attention of the House to the existence of a law which was enacted at a time when farmers were disposed to fight Government encouragement of automobiles because of the effect on horses. No money can be expended for automobiles without the express authorization of Congress. The Illinois legislator believes that the law should be revoked since the farmers own more automobiles than any other class.

Appropriation Limits Aeronautic Research

WASHINGTON, Jan. 10—Aeronautical research will be restricted this year because of reduced appropriations passed by the House for the maintainance and operation of the National Advisory Committee for Aeronautics. A total of $405,266 was asked specifically for development of aeronautic power plant materials and aero dynamical research. The House appropriations committee and subsequently the whole House allowed only $260,000 for scientific inquiry and administrative expenses.

It is understood here that engineers and manufacturers interested in the promotion of the science of aeronautics intend to bring pressure to bear on the Senate in order to restore the original estimate for the advisory committee.

The estimate of $131,600 for power plant research prepared by the advisory committee was to be devoted to current problems with a view of reducing costs of engines, fuel and other maintenance charges which hinder the development of commercial aviation. The program also contained a provision for continuing the performance tests of new and improved aircraft engines and accessories.

MOBILE LOSES STOCK LICENSE

ATLANTA, Jan. 10—Alleging that the Mobile Tractor Co., of Mobile, Ala., has been proven guilty of fraudulent transactions, the Georgia Securities Commission has revoked the company's license to sell stock in Georgia. The Mobile concern is one of the largest tractor manufacturing companies in the South.

N. A. C. C. to Consider Foreign Financing

Believe New Corporation Will Have Important Part in Developing Trade

NEW YORK, Jan. 8—The part that the automotive industries will play in the formation of the Foreign Financing Corp., the export financing institution which is being organized by the American Bankers Association, will be taken up at a forthcoming meeting of the foreign trade section of the National Automobile Chamber of Commerce. In making this announcement, George F. Bauer, the N. A. C. C. foreign trade secretary, said it was hoped to have the industry well represented in the organization of the proposed banking company.

The Foreign Financing Corp. is to have a capitalization of $100,000,000, which will give it a loaning power of ten times that amount. At the recent meeting in Chicago when it was considered by bankers and business men from all parts of the country, it was decided that its capitalization would be undertaken by districts and industries. Exports from these industries and districts would be financed by the company in proportion to the amount of capital stock thus underwritten.

The meeting of the N. A. C. C. committee will take up this angle from the standpoint of the automotive industries, as it is recognized that such a financing corporation may play a big part in the future foreign trade of the United States. The committee of thirty which is organizing the bank has two automotive representatives—Roy D. Chapin, of the Hudson Motors Car Co., and John S. Raskob, of the General Motors and Du-Pont interests. In addition, J. Walter Drake, of the Hupmobile company, was instrumental in perfecting the company's plans.

A meeting of the foreign trade committee of the Chamber will be held on Tuesday, Jan. 11. This will be closed to the seven members of the committee. The next open meeting will be that at which the Foreign Financing Corp. will be considered.

ANTIGO DOUBLES CAPITAL

ANTIGO, WIS., Jan. 10—In increasing its capitalization from the original amount of $500,000 to $1,000,000 upon starting active quantity output, the Antigo Tractor Co. of Antigo, Wis., has reincorporated as the Antigo Tractor Corp. It recently purchased the foundry, machine shop and equipment of the Murray-Mylrea Co. at Antigo and began production to-day under the direction of W. L. Carver, general manager, formerly of the Mid-West Engine Co., Indianapolis. F. H. Houck, formerly with the same concern, and C. R. Parrott, until now with the Universal tractor division of the Moline Plow Co., will be Carver's chief aides.

Confidence Features 21st N.A.C.C. Dinner

Enthusiasm Manifested at Show Kills Fears of Continued Depression in Industry

NEW YORK, Jan. 12—Nearly 700 representatives of the automotive industry, most of them passenger car makers and officers of their companies, attended the 21st annual dinner of the National Automobile Chamber of Commerce at the Commodore last night. There was no atmosphere of gloom but rather the reverse. The diners seemed to feel that the worst is over.

"I believe the tide has turned," was the smiling declaration of Edward R. Tinker, vice-president of the Chase National Bank and one of the leading automobile bankers of the country. He was one of the dominating factors in the reorganization of the Maxwell and Chalmers companies and has complete faith in the future of the industry.

"Things aren't so ——— bad as they have seemed," declared Col. Charles Clifton, president of the N. A. C. C. and one of the "grand old men" of the industry in his opening remarks as toastmaster.

The note of confidence which has permeated the show dominated the dinner. The men who attended were a bit more serious than they have been some other years but the seriousness was born of determination to succeed rather than discouragement. It was significant that a score of the most prominent automobile bankers in the city were interested guests.

Francis H. Sisson, vice-president of the Guaranty Trust Co., who discussed the economic situation from the viewpoint of a banker, declared the most critical of the post-war readjustments have been passed, although many more must yet be made. The most important of these, he said, is the adjustment of retail prices to declining wholesale prices and the costs of production to present purchasing power.

Wage Adjustment to Cut Cost

"The adjustment of production costs will consist chiefly of wage readjustments," he said, "although increased efficiency and decreased margins of profit will play their part. The laborers who profited most from the ever-soaring wages during the war and for some time after will feel the curtailment first and most, but they should be in a better position to bear it than their less fortunate fellow-workers.

"We are not in the throes of overproduction, but merely temporary underconsumption. And it is significant, in this connection, to note that when goods are offered for sale at retail prices which the public believes to be fairly commensurate with prevailing wholesale prices and costs of production they are eagerly bought. Despite the materially lessened purchasing power in agricultural sections, occasioned by the precipitate decline in the price of farm products, and in certain industrial sections, because of closed plants or the part-time operation of factories and reductions in wages, there is still a tremendous buying power and always will be.

"Wages cannot be sustained on an uneconomic basis any more than can farm products or any other commodities. All necessary liquidations must run their course, and the sooner and franker we face that fact and discount its inescapable consequences the better off we shall be. The producers and merchants who persist in holding their goods for prices that the public will not pay are courting disaster and preparing to swell the number of commercial failures. They have not learned the elemental rule of successful merchandising that profits come from turning over capital. They are endeavoring to ignore the inexorable law of supply and demand.

"American business men must recognize the vital fact that one of the most important factors in our prosperity henceforth will be our foreign trade. The extent to which our overseas trade is sustained and increased will depend to a large degree upon the methods devised for financing it.

World Looks to United States

"The world to-day looks to the United States as the one solidly fortified nation in the realm of finance and trade. No other country has to a like extent the great power needed to meet the present emergencies.

"As on a memorable occasion when Marshal Joffre decided that France would not yield another foot of ground and determined that the enemy should not pass at the Marne, the American people have reached the point in their post-war economic readjustments where they are called upon to stand firm to stop retreating and go forward. The present hour calls not so much for better conditions as it does for stronger courage; the existing situation requires less confusion, and more confidence."

The annual awards of medals evoked howls of mirth. The victims were Walter P. Chrysler, Henry M. and W. C. Leland, Windsor T. White, Emlen S. Hare and A. I. Brousseau, president of the International Motor Co.

Chrysler was told he was decorated because he had been so successful in standing around where he could be "discovered" by C. W. Nash and John Willys. His medal was given for his success in ironing out complications in the industry and it was remarked he found time to get behind the scenes in the Maxwell-Chalmers two ring circus.

The diners rose to greet Henry M. Leland and his son when they were called to the platform. They were told they had been summoned to find out when they would get into production and they were advised that if they had made mistakes not to admit them now but to wait until their car gets into the hands of the people.

White "Blazed" Industry's Way

White was complimented because he had "blazed" the way for the industry "in an inflammatory sense." It was remarked that he had "removed some of the surplus weight" from his passenger car "and labelled the invention a truck."

Hare was hailed as a man who was brave enough to tackle anything and one who, in the goodness of his heart, had rescued "several grand old museums of by-gone days."

Brousseau, it was asserted, was most revered by the road building machinery dealers because he was the maker of "graceful rolling warehouses" which were invaluable as road destroyers.

Maxwell-Chalmers Assets $41,000,000

Consolidated Companies on Sound Basis for Operation—Inventories Written Low

NEW YORK, Jan. 12—After weary months of conference and compromise the reorganization plan which will bring about a formal consolidation of the Maxwell Motor Car Co. and the Chalmers Motor Corp. was declared operative yesterday by the managing and reorganization committee headed by Walter P. Chrysler and J. R. Harbeck. More than 87 per cent of the outstanding stock of the two companies has been deposited under the plan, but the committee is extending until Feb. 1 the time under which deposits of stock and unsecured claims can be made without penalty. The following statement on the financial status of the new organization was made by Harbeck:

"The new company is now placed in an extremely fortunate position to face the conditions confronting the automobile industry. The net outstanding obligations of the Maxwell and Chalmers companies have been reduced, through liquidation, by approximately $11,000,000. This liquidation has been largely through the sale of cars in dealers' hands, resulting in a reduction of the companies' obligations arising from the discounting of dealers' notes, paper, etc. The merchandise and bank creditors are to be amply protected through substantial cash payments and the funding of the balance of the obligations upon a one, two and three year serial note basis.

"The new company's balance sheet shows net current assets of about $41,000,000 after depreciation, and net current liabilities of about $6,000,000, the ratio of current assets to current liabilities being approximately seven to one. Inventories have been substantially written down, so that the reorganized company will not be handicapped by having to take into 1921 operations losses chargeable to previous years.

"The reorganized company may be regarded as being upon a sound basis for profitable operation on the basis of reduced sale prices. During the reorganization period points of contact with the public have been more than doubled through establishment of additional selling agencies and branches.

"An analysis of the balance sheet, after excluding good-will and allowing $100 per share for the A shares, which are preference shares, shows a book value for the B stock of approximately $30."

SURPLUS WAR PLANES SOLD

NEW YORK, Jan. 10—The Aeromarine Plane & Motor Co. has taken over $4,000,000 worth of surplus naval aircraft and engines. This marks the first step in the retirement of the Government's surplus aeronautic stocks.

Wall Street Sees Good Normal Year

Tendency Probable Toward Consolidation of Weak Sisters—Stocks Show Gains

By JACQUES COHEN
of J. S. Bache & Co.

NEW YORK, Jan. 13—The recent recovery in the prices of industrial stocks has been fully reflected in automobile stocks as well. Wall Street was extremely bearish on motor stocks during the last two months of 1920 with the result that there was built up in this group what is commonly termed an "overcrowded short interest;" in other words, people speculatively inclined believed motor stocks were definitely on the downward grade and would have no chance of recovery for a long time to come. These people sold stock in anticipation of buying back cheaper. Consequently there was established a potential buying power which, once it got under way, generated sufficient momentum to make those people who were "short" run to cover.

The general consensus in Wall Street seems to be, however, that this recovery in motor stocks is temporary and that, after the recovery has run its course, security prices will again lapse toward a lower level, but not so low as the low prices of December. Then Studebaker sold at 37¾, General Motors at 12⅞, Willys-Overland at 5⅛, Pierce-Arrow at 15 and White at 30½. At present, prices recoveries have been anywhere from 3½ points in General Motors to 18 points in Studebaker.

The stocks of finished cars on hand are considerably below the high point a few months ago and are gradually being reduced to a point where production on a conservative basis will meet the demand and prevent a recurrence of a period of saturation such as we had three or four months ago.

Credit Burden on Banks Easier

There has been some speculative enthusiasm because of the automobile show and the presence here of important automobile officials for that event. The bright spot on the horizon, however, is the fact that curtailment of production and the gradual reduction of inventories will increase working capital to a point where the banks will be substantially relieved of their carrying loads and the industry as a whole will rapidly recover in health.

Prominent bankers seem to agree that the outlook for this year is not so bright as it was for 1919 and 1920 but that, on the whole, business will be fairly good and that there will be a tendency toward consolidation of "weak sisters" for the purpose of bolstering up the industry as a whole. Consequently, an era of consolidation may be looked forward to with eventual improvement in security prices, since Wall Street always views consolidations and mergers of companies in a favorable light.

Report Ford to Offer $100,000,000 in Stock

NEW YORK, Jan. 12—Financial circles in this city have been deeply interested this week in circumstantial reports that Henry Ford proposes to offer to the public in the near future an issue of $100,000,000 participating 8 per cent preferred stock of the Ford Motor Co. The stock would participate in the earnings of the company up to 12 per cent, it is stated, but would have no voting power.

Ford does not intend to offer any part of the stock to the banks, it is said, but intends to sell all of it to the public. He is reported to be confident that he would have no difficulty in disposing of it to the public and that the offering would be over-subscribed quickly.

Although official confirmation of the report is lacking, bankers here are inclined to believe it is true.

Remy Reduces Wages; Other Units Not Bound

ANDERSON, IND., Jan. 10—A general wage reduction of 20 per cent has been made by the Remy electric division of the General Motors Corp. The plant has been shut down practically since early in December, but in the past few days almost 100 men have been put back to work at the new wage scale in the service department. It is believed that other departments will resume within the next month. At the time the Remy plant shut down in December it was employing 1000 persons as against 3000 two years ago.

No Simultaneous Cuts

NEW YORK, Jan. 10—It was said at the headquarters of the General Motors Corp. that the action of the Remy Electric Division does not mean simultaneous wage cuts in all the parts plants of the corporation. Advisability of wage reductions will be determined by the managers of the individual units and will depend largely upon local conditions.

FORD LAND INCORPORATED

HOUGHTON, MICH., Jan. 10—Articles of incorporation for the Michigan Iron, Land & Lumber Co., capitalized at $2,000,000, have been filed by Henry Ford, Edsel Ford and Clara Ford. The company was formed to take over the assets of the Michigan Iron & Land Co., which was purchased by the Fords several months ago. It will do a general manufacturing lumbering and mercantile business. The main business will be the working up into automobile parts of lumber cut from the company's holdings. This will be done at the new Iron Mountain plant. The property comprises 68,000 acres, rich in iron ore and it is expected the Fords ultimately will engage in mining operations.

Truck Census Seen as Aid to Selling

N. A. C. C. Committee Authorizes Complete Survey of Country—Endorse Uniform Law

NEW YORK, Jan. 12—A census of the motor trucks in the United States was authorized by the Motor Truck Committee of the National Automobile Chamber of Commerce at its meeting here yesterday. It will extend to all communities in the country and will determine the conditions of the trucks, for what they are being used and their tonnage. The information would inform manufacturers on the extent to which motor trucks have been sold and would give valuable information regarding potential markets. This census will be supplemental to the survey now being made of the use of motor trucks on farms and when both are complete it is expected that practically every truck in the country will be listed.

The committee endorsed the provisions and alterations in the proposed uniform motor vehicle law as recommended by the Motor Vehicle Conference Committee.

Serious consideration also was given to the subject of highway impact tests which are being made by the Federal Bureau of Roads. The committee is ready to co-operate in every way in its power in the development of the nation's highway system.

Information has reached the committee disclosing that state highway departments are renting trucks given them by the government to county highway supervisors at the rate of $25 a year.

Sale of Used Trucks Is Started on Coast

LOS ANGELES, Jan. 10—Colonel Pierce is here with seventy-five Packard and Riker trucks brought from abroad and starts the sale of them Wednesday through a local dealer. The truck industry here is greatly disturbed and has appealed to the National Automobile Chamber of Commerce and the National Automobile Dealers' Association. The sale of these trucks, it is feared, will demoralize the used truck market and have a bad effect on the new truck business.

Colonel Pierce, the American representative of the Slough Trading Corp., has declared that if the trucks meet satisfactory demand hundreds more will be brought into the country from abroad. They are all of American manufacture which were turned over to the British.

DECEMBER PRODUCTION DROPS

NEW YORK, Jan. 13—December shipping figures gathered by the National Automobile Chamber of Commerce show that 11,814 carloads of passenger cars were shipped last month and that there were 6500 driveaways.

Team-work Wanted, Parts Men Are Told

M. A. M. A. Hears Inspirational Talk by G. M. Graham—Dinner Big Success

NEW YORK, Jan. 13 — Nearly 400 members of the Motor and Accessory Manufacturers' Association attended the annual meeting of the organization at the Biltmore yesterday afternoon. The attendance came close to establishing a record and demonstrated that a large number of representatives of this branch of the industry are attending the show. The feeling among the members was optimistic and confidence was expressed that there will be a slow but steady improvement in business from now on.

The annual meeting this year offered an innovation. The usual lengthy reports covering the activities of the organization were eliminated and an inspirational address by George M. Graham, sales manager of the Pierce-Arrow Co., substituted. Graham pointed out the community of interest which exists between the parts and vehicle manufacturers. He told why there need be no fear about the future of the industry and asserted that conditions would improve from now on although the problem is to get away slowly and gather momentum as the year advances. He declared the men in the industry are courageous and for that reason are hanging on so gamely that there need be no fear of disaster.

The meeting was a fitting preliminary to the annual dinner last night. The feast and fun festival was fully up to the high standard already set and there were no dull moments for the 500 diners. Sidney S. Meyers, general counsel of the association, acting as impressario, transported Florenz Ziegfeld and the "Midnight Frolic" bodily from the New Amsterdam Roof.

The banqueters liked the show and showed their approval by generous applause. The performance ran as smoothly as it would if the performers had been at home. The music was by the "Midnight Frolic" orchestra. An ample stage had been built for the occasion at one end of the grand ballroom of the Commodore, where the dinner was served. Meyers and the other officers of the association were showered with congratulations upon the success of their efforts. According to the custom of the M. A. M. A., there were no speeches at the dinner.

Austin Makes Plans for Large Production

NEW YORK, Jan. 12—Manufacturing plans of the Austin Motor Co., Ltd., Birmingham, England, call for a production in 1921 of 10,000 automobiles, 10,000 farm tractors, 5000 trucks, 7500 farm light plants and 1500 airplanes, according to Major H. J. Cupper, American representative of the company, who is showing the Austin car and chassis at the Waldorf-Astoria during show week here.

The company is planning to export 1000 cars to the United States in 1921, the Major declared, and hoped to increase this number to 3000 in 1922. Sales offices and parts stations will be established in New York, Philadelphia, Washington, Chicago, Detroit, Boston, Atlanta, Los Angeles, San Francisco and Seattle. Wholesale branches will be maintained in New York and Montreal.

The Austin company passed the dividend on its preference shares early in January to conserve finances.

Haynes Is Elected to Dodge Presidency

NEW YORK, Jan. 12—The election of F. J. Haynes to the presidency of Dodge Brothers, at a directors' meeting in Detroit yesterday, was greeted with great enthusiasm by Dodge dealers attending a show luncheon at the Waldorf-Astoria here. Announcement of the election was made by Charles W. Matheson, general sales manager, who was presiding at the dealers' meeting. Howard B. Bloomer, personal friend and attorney to John and Horace Dodge, was elected chairman of the board of directors.

Haynes has been with Dodge since 1912, beginning as factory manager and working his way to the vice-presidency and general managership. He was with Franklin from 1901 to 1912 and prior to that had been with the E. C. Stearns Co., Toronto, and the National Cycle & Automobile Co. Haynes was superintendent of the Hamilton plant of the National company and there first became associated with John Dodge, then general manager there.

INDUSTRY URGES AIR MAIL

WASHINGTON, Jan. 12—Manufacturers of aircraft and industry in general are making a determined fight here this week to induce the Senate to restore the appropriation for the Air Mail Service which the House eliminated in passing the Post Office bill last week. The entire item was stricken from the House bill. The House Committee on Post Offices and Post Roads had recommended the appropriation of $1,250,000 or $2,250,000 less than the departmental estimates.

TAKE OVER AMERICAN BUS

CHICAGO, Jan. 12—The reorganization report on the American Motor Bus Corp., and the Chicago Motor Bus Co., submitted by Harold Almert, consulting engineer, has been adopted by the bankers, and the business of the two concerns taken over by the Lake Shore Motor Bus Corp., a holding company.

The American Motor Bus Corp., the manufacturing concern, has resumed the manufacture of front wheel drive, stepless type, motor buses and is bringing out a new double deck bus with a seating capacity of sixty passengers, with both upper and lower decks fully enclosed. The initial order will keep the factory operating at full capacity for the year 1921.

Retail Sales Show Business Returning

Placing of Dealers' Orders Indicates Good Spring Trade for Manufacturers

NEW YORK, Jan. 13—Retail sales in as great a volume as have been made at any New York show except that of 1919 are recorded as the week ends. The 1919 show, staged by the New York dealers and presenting automobiles publicly for the first time after the armistice, was phenomenal as a selling agency. But sales this year are fully up to those of the 1920 exposition in practically all lines of cars. Attendance to date is 10 per cent ahead of last year. Some remarkable prospect lists have been made up.

Attendance of dealers, particularly from the Eastern territory, is better than the average at a New York show. Dealers appear to have come in for two purposes, to feel the buying pulse and to obtain merchandising ideas. The crowds and the buying at the show have induced placing of orders for resumption of shipments of cars under allotments, not in many cases up to 100 per cent but in sufficient degree to encourage many manufacturers to proceed in anticipation of a good spring business.

A meeting of the Eastern Automotive Equipment Association early in the week and patronage of the equipment exhibits at the Palace reveals a gradual, yet steady, return of buying in this field.

Higher Car Tariff Opposed by N. A. C. C.

NEW YORK, Jan. 13—Directors of the National Automobile Chamber of Commerce decided at a meeting yesterday to join with the National Founders Association in opposing an increase in tariff duties on aluminum. It is contended that the aluminum industry is virtually a monopoly now and that it needs no protection. A higher tariff would not result in increased revenue, it is held, because it would curtail imports.

Representatives of the N. A. C. C. will appear before the House Ways and Means Committee at Washington tomorrow to protest against the imposition of higher duties on automobiles and urge that all automobiles, regardless of value, come under the 30 per cent rate. An increase in tariff imposts would result in penalties being applied to American cars by other countries, the industry believes, and cause a reduction in the volume of exports.

A. J. Brousseau, president of the International Motor Co., was designated to represent the N. A. C. C. on the National Research Council.

The directors adopted a resolution expressing deep regret at the death of Horace E. Dodge. They elected Frederick J. Haynes, the new president of Dodge Bros., a director to succeed Dodge.

Goodyear Financing Matter of Selection

Choice of Several Plans Rests With Backers — Propose Organization Changes

NEW YORK, Jan. 12—Considerable progress is being made in the difficult tasks of readjusting the financial affairs of the Goodyear Tire & Rubber Co. Several plans have been taken up by the bankers interested as well as by unsecured creditors. One of these calls for an issue of junior securities to protect the claims of the unsecured creditors and a first mortgage to cover the bank borrowing.

Whatever plan is worked out, it is proposed to make important changes in the management of the corporation, and it can be said upon authority that a strong corporation executive will be placed in a position of authority so that he can readjust the affairs of the company on a sound operating basis.

The main difficulty now is getting the various interests to agree upon some basis of adjustment. There is every reason to believe that this ultimately will be done. The great tire company is entirely solvent and its difficulties are the result of the general financial and industrial depression. It is expected that the details of refinancing will be announced at the next meeting of the stockholders.

The merchandise creditors have declined to accept a proposal to take 75 per cent of their claims in cash and the balance in 5-year bonds. They have made a counter proposal that they be paid 60 per cent in cash and be given 1-year notes for 20 per cent and 2-year notes for the remainder. Their theory in this plan is that the notes would be virtually negotiable.

The preferred stockholders of the Goodyear Tire & Rubber Co. adjourned until Jan. 21 at a meeting held this morning. No announcement regarding the refinancing was made.

Cobleigh and Reeves Talk to Service Men

NEW YORK, Jan. 12—Over one hundred service executives attended the second annual convention of Automotive Service Associations held at the Hotel Commodore all day Monday. A number of prominent speakers addressed the delegates and plans were made to co-ordinate the efforts of the various associations, of which there are eleven at the present time. The morning session was devoted to reports from the delegates and the address of welcome by H. R. Cobleigh, secretary of the Service Committee of the National Automobile Chamber of Commerce.

Cobleigh briefly told of the early struggles of some of the associations; of the interest of the manufacturers in the movement, and of the formation of the Service Committee which, among other things, was formed to get a point of contact between factory service managers and local service managers. He predicted great strides during the coming year. Activity reports were read by delegates of the Brooklyn, New York, Newark, Baltimore, Western Massachusetts and Syracuse Automotive Service Associations and the Automotive Electric Service Association.

Army Not Contracting for Additional Trucks

WASHINGTON, Jan. 11—Reports current in the industry that the War Department refused to release truck manufacturers from contracts while Congress was proposing to dump the army surplus trucks on the market were officially denied at the War Department to-day. It was stated that the army is not buying trucks at present because it has adequate equipment on hand.

The announcement that truck manufacturers at Kenosha, Wis., were resuming production of War Department contracts is true, it was said. The Winther Motor Co., the Marwin Truck Co., and the Kenosha Wheel & Axle Co. took over the completion of a contract awarded the Sinclair Motors Co. in December, 1919. This contract called for the delivery of 75 militor tractors in May, 1920.

According to the War Department it was owing to financial difficulties that the Sinclair Co. transferrred the contract. The tractors represent a special experimental type designed by the Westerfelt Board for use with artillery. The total value of the contract is estimated at $600,000.

Winther Starts Contract

KENOSHA, WIS., Jan. 10—The Winther Motor Co., the Marwin Truck Corp., and the Kenosha Wheel & Axle Co, are preparing to resume production on a maximum capacity schedule by the end of this month in order to handle a large Government contract amounting to more than $3,000,000 and calling for 300 1½-ton and 75 3-ton trucks. The contract was issued by Charles Margerum, of the motor vehicles branch at Washington. All of the trucks will be of the quadruple drive type.

KENDAL RECEIVER ASKED

CANTON, OHIO, Jan. 10—Suit has been filed here asking for the appointment of a receiver for the Kendal Tire & Rubber Co., Massillon, by Charles Russ, a stockholder. The petition declares that the company has never manufactured any tires except a few samples. It is further declared that the plant has been sold to the Ariston Tire & Rubber Co., Chicago, by the promoters and officers who control a major part of the common stock. Russ alleges in his petition that the rights of the original stockholders were not safeguarded and asks that the sale be set aside and a receiver appointed.

Government Settles Templar War Claim

Payment of $650,000 Eases Financial Burden—To Proceed With Production

CLEVELAND, Jan. 10—The financial condition of the Templar Motor Co. has been improved materially by the settlement of the company's claim for war work against the United States Government. The claim was settled for approximately $650,000 under the Dent act and about all of the money has been paid.

The original claim was for $1,000,000 and the settlement is regarded as an equitable one. While it does not mean the full amount of the claim, deduction having been made for interest on delayed settlement and profit which would have been realized had the contract been fully completed, it nevertheless reimburses the Templar for all the money spent in changing over the plant for war purposes, materials bought, etc., and allows them a profit on the work actually completed.

The settlement puts considerable cash into the company's treasury which will be of assistance in carrying the present inventory and in manufacturing cars during the winter months for spring production.

Bramley Heads Safety Council

CLEVELAND, Jan. 10—M. F. Bramley, president of Templar Motors, has been elected president of the Cleveland Safety Council, an organization that is waging a fight to cut down automobile accidents. J. V. Whitebeck, of the Cleveland Automobile Co., is a vice-president of the council.

DODGE ESTATE TO WIDOW

DETROIT, Jan. 2—The will of Horace E. Dodge, filed for probate to-day, leaves practically the entire estate, estimated at $50,000,000, to Mrs. Dodge and Howard B. Bloomer, chairman of the board of the Dodge Bros. Motor Car Co., as trustees. The widow will receive the income until her death, when the estate will be divided equally between the two children, Horace E. Dodge and Mrs. Delphine Dodge Cromwell, provided they are 30 years old. If they have not reached that age the property will be held in trust until they are 30.

DUNLOP SUSPENDS OPERATIONS

BUFFALO, Jan. 13—Directors of the Dunlop Tire & Rubber Co. have issued a statement announcing that "general conditions in the automobile industry are such" that they are justified in practically suspending operations. April 1 has been set as the date for resumption, although it may be earlier. The British Dunlop Co. has stated that negotiations were pending in this country for a large loan to the American company by American capitalists.

Military Necessity May Retain Trucks

General Staff Likely to Win Point in Controversy Over Anthony Proposal

WASHINGTON, Jan. 11—Investigation here discloses that there is little probability that Representative Anthony of Kansas will be successful in his attempt to have dumped on the public some 20,000 motor trucks owned by the War Department. He has made this proposal as a measure of economy and it has been given serious consideration but it has met with the strenuous opposition of the General Staff and military considerations are likely to win the day.

Anthony has asserted that the army has many more trucks than it needs except in case of war and it is his idea that if a military emergency arose the trucks needed could be commandeered. The answer of the General Staff to this suggestion is that if trucks were commandeered it would be impossible to service them and that the question of replacing essential parts would offer an insurmountable obstacle to the success of the plan.

Since the beginning of the war the army has purchased approximately 64,000 motor vehicles, trucks and passenger cars. It has disposed of 34,393, most of which went to state highway departments and departments of the government. The trucks on hand Jan. 1 numbered 29,881. It is contended there is no surplus now but it is expected that in the near future the army will dispose of 6,850 trucks and 680 passenger cars. This would leave only 22,785 motor vehicles on hand. Of this number the National Guard of the various states will be supplied with 2,479 trucks and 166 passenger cars.

Under the law the vehicles which the army does not need must be turned over to other branches of the government. New legislation would be required before they could be sold to the public and it is not believed probable that there will be any amendments to the law at this session.

TO SELL CANTON COMPANY

CANTON, OHIO, Jan. 10—A court order has been issued calling for the sale on Jan. 22 of the assets of the Canton Automobile Parts Mfg. Co. which went into receivership several weeks ago. The court ordered that the property must not be sold for less than $50,000. It was organized to manufacture a new kind of piston ring.

EVINRUDE IN NEW PLANT

MILWAUKEE, Jan. 10—The Evinrude Motor Co. of Milwaukee, pioneer manufacturer of detachable gas engines to propel rowboats, canoes, etc., has moved into its new plant, occupying a tract of six acres. It will put into production a new type of oil engine for farm and similar purposes, in addition to greatly increasing its output of rowboat motors. The main shop is 200 x 300 ft.; the foundry, 75 x 100 ft., and the boat shop and warehouse, 100 x 150 ft. The company was founded in 1912 by Ole Evinrude, inventor of the detachable boat engine. It has outgrown three plants in eight years. The present capitalization is $500,000, and the principal officers are C. J. Meyer, president, and Hugo Biersach, secretary and treasurer.

C. G. Spring Acquires United States Bumper

KALAMAZOO, MICH., Jan. 10—The C. G. Spring Co., has purchased the assets and business of the U. S. Automobile Bumper Co., Chicago, and will move the industry intact to this city, doing all manufacturing here. The addition of this line to the present product of the plant will not require any extended layout for buildings or equipment, at least not for the time being.

Another step in the expansion of the C. G. Spring Co. is the announcement that the concern has opened branch service and repair stations in Detroit and Chicago. The Detroit station is on Woodward avenue, near the Cadillac plant, while the Chicago branch is at 3021 Michigan avenue. They will specialize in repairs to springs and replacements, also in the installation of the new type bumpers. These stations will be under the supervision of D. M. Short, who was associated with Girl, during the latter's connection with the Perfection Spring company.

At a special meeting of the directors, held Friday afternoon, Fred R. Eaton, cashier of the Kalamazoo National bank was elected to membership on the board. Eaton's acceptance of membership on the board adds to the conservative strength of the institution and meets with general favor in local financial and manufacturing circles.

SUBMIT TRUCK UTILITY BILL

DETROIT, Jan. 7—The bill extending the powers of the State Utilities Commission to cover the operation of the motor truck lines was introduced in the Michigan Legislature by Representative L. G. DeFoe. The bill stated that the motor truck lines have become an important part of the transportation system in competing with railroads and interurbans, and is at present without State control as to rates and service. This measure will provide supervision.

TO MOVE TRACTOR EXHIBITS

COLUMBUS, OHIO, Jan. 10—The management of the National Tractor Show has arranged with the Columbus Transfer Co. to take care of all freight shipments to the show in the event the exhibitor has no Columbus connection. The rate from the freight houses to the fair grounds will be $3.50 a ton and from the switch at the fair grounds to the show buildings, $3.50 a ton.

METAL MARKETS

PRICE movements during the next few weeks are almost certain to be devoid of the spectacular. In the pig iron market the trend is still declivous, what little activity being noticed consisting of resales of odd lots of foundry iron at prices much closer to a $30 base than the quotations of producers. In a condition emphasized by an excess of supply over demand this denotes the direction in which the market is headed and, taking the past relationship of pig iron values to those for semi-finished and finished steel into account, readjustment of the former can hardly be considered completed until after $30, valley, quotations represent the maximum, ranging down to a minimum of at least $1 to $2 below that figure. This, at least, seems to be the attitude of quite a number of buyers who are holding off until sufficient time has passed to show whether their judgment is correct or not. Numerically, there is a gratifying amount of inquiries from the automotive industries for finished steel, albeit nearly all of these inquiries are of a tentative character and the tonnages involved, compared with those customary last summer, light. In other words, a large number of small orders are hanging fire. The tardiness which characterizes these negotiations is to be ascribed to two causes. In the first place, a number of automotive buyers are endeavoring to hold off committing themselves until they have gained a somewhat better idea of the 1921 prospects for the sale of their own products. The second reason for procrastination is that there are still those who do not think that the declines in the steel market will stop at adoption by the independents of the Corporation's price levels, but that a waiting attitude on the part of buyers will force the independents' prices still further downward. The steel market's best judgment is that, if such recessions ensue, they will be general, with the Corporation taking the lead and, furthermore, that it will be two to three months before such a contingency will have to be reckoned with. By that time readjustment of wage scales will have been completed and, if a latent demand which can be forced on to order books through price reductions, is visible, say, by March 15, those who are shaping the steel industry's price policy will not be slow in resorting to such a step. Price reductions in the steel industry are, in fact, invariably made on the eve of a transparent buying movement and never when the demand would be light in spite of lower prices. By this is not meant that there may not be some slight readjustments long before the ides of March. In fact, here and there rumors are heard even now of this or that independent being disposed to cut under the Corporation's price for some specialty. So far, these instances are exceptions, however, proving the general price uniformity rather than the opposite.

Pig Iron—Malleable is still offered for resale in limited tonnages by a Detroit automotive interest at $31. There is no question that much iron is available on a $30 basis, not only in the valley, where that level has come to be the Basic quotation, but also at Buffalo and other furnace and distributing points.

Steel—Automobile sheets rule quiet and steady. Some contracts are pending. Prices on cold rolled strip and most other grades of steel are being maintained largely because producers recognize slashing would not serve to stimulate buying.

Tin—This metal moves in harmony with pound sterling exchange.

FINANCIAL NOTES

Black & Decker Mfg. Co., Baltimore, has declared a dividend of 2 per cent on the common stock, payable to stockholders of record Dec. 30. This makes a total of 7 per cent paid during the year on the common stock of the company. Regular payments also have been made on the preferred. This showing is regarded as somewhat remarkable, in view of the general depression and the passing of dividends by many companies.

Kahlenberg Bros. Co., of Two Rivers, Wis., a large builder of oil engines for marine uses, has increased its capital stock from $75,000 to $300,000 to accommodate the expansion of its plant and business. It is filling large domestic and export orders and making shipments to China, Alaska, Cuba and other countries steadily. William Kahlenberg is president.

Parenti Motors Corp., Buffalo, at a shareholders' meeting Jan. 3, increased its capitalization from $2,500,000 to $11,000,000, to provide for expansion. The original capitalization was $1,000,000 preferred and $1,500,000 common and the increase consists of $10,000,000 common of $10 par value. The original issue is all subscribed.

Pierce-Arrow Motor Car Co. financial position is shown to be exceptionally strong with current assets in the ratio of nearly 4 to 1. Inventory is about 20 per cent larger than a year ago because of preparations for production of the new model. Sales for the year were 20 per cent lower than in 1919.

Fisher Body Corp. will pay a dividend of 1¾ per cent on the preferred stock of the company on Feb. 1. A dividend of $2.50 a share will be paid on the same date on the no-par common stock of the company.

Kelly-Springfield Tire Co. has declared dividends of $1 and 3 per cent in stock on the common stock payable Feb. 1, and a quarterly dividend of $2 on preferred stock payable Feb. 15.

United States Rubber Co. will pay a regular quarterly dividend of $2 a share on its first preferred and $2 a share on common stock on Jan. 31.

Mullins Body Corp. declared the regular quarterly dividends of $1 a share on common and $2 a share on preferred stock payable Feb. 12.

India Tire & Rubber Co. paid a dividend of 1¾ per cent on its preferred stock and 2 per cent on common stock on Jan. 10.

Standard Motor Construction Co. has declared a dividend of 2½ per cent payable February 1 to stockholders January 3.

Pawling & Harnischfeger Co., Milwaukee, has increased its capitalization from $1,000,000 to $3,000,000.

Briscoe Motor Corp. has deferred payment of the usual quarterly dividend on preferred stock.

Vulcan Automotive Parts Co., has increased its capital stock from $2,000,000 to $10,000,000.

Wilson Tire & Rubber Co. will not pay any dividends on its capital stock for the year 1921.

Steel Products Company on Three-day Basis

LANCASTER, PA., Jan. 11—Conditions as reflected by two big local plants engaged closely with the automobile trade are in direct contradiction to each other. Officials of the Rowe Motor Truck Co. announce that $1,000,000 of the company's 8 per cent preferred stock has been underwritten and will be expended to carry out a general broadening policy.

Officials of the Steel Products Co., one of many plants operated by the General Motors Co., has announced that, starting immediately, the plant will work but three days each week until further notice. This order follows the laying off of several hundred workmen and a big reduction in salaries.

Precision Castings in Receiver's Hands

SYRACUSE, Jan. 12—C. Hamilton Sanford is named receiver of the Precision Castings Co., Inc., of Fayetteville, in an order signed by United States Judge George W. Ray, which enjoins creditors from bringing action, or taking other proceedings against the company. Pressure brought to bear by a number of creditors is responsible for an equity action instituted to conserve the company's assets during the period while collection of accounts due from large automobile corporations is at low ebb. The suit was started by the Greenwich Trust Co., of Greenwich, Conn.

Federal Rubber Starts 40 Per Cent Capacity

MILWAUKEE, Jan. 10—After a curtailment of production for about a month, the Federal Rubber Co. of Cudahy, suburb of Milwaukee, resumed operations to-day with a force of about 900 men, or about 40 per cent of capacity. According to Arthur A. Frank, factory manager, business has improved substantially while a proper readjustment of stock and materials has been effected. He looks for continued increase in operations from this time forward. The Federal was one of the last of the larger tire manufacturers to curtail when over-production set in.

FACTORY EXECUTIVES ASSUME ACTIVE ROLES

(*Continued from page* 87)

Dixie Flyer—Stephen Miller, vice-president and sales manager; E. Palmer, manager of export department.

Lincoln—R. C. Getsinger, sales manager; A. H. Schiappacasse, service manager; F. G. Eastman, advertising manager; E. E. Sweet, consulting engineer; T. H. Mueller, chief engineer; W. W. Robertson, service engineer.

Lafayette—Leo N. Burnett, advertising manager.

Studebaker—William A. Morrow, general sales manager.

Monroe—President William Small; George Seibert, sales manager; Glen Todd, secretary-treasurer.

Paige—G. B. Gaunt, sales manager; John Germontrez, engineering department.

Stutz—T. L. Marshall, sales manager.

Pilot—Joseph W. Connor, sales manager.

Hanson—Charles A. Verlin, eastern factory representative.

Kline—L. H. Travers, sales manager.

Reo—R. E. Olds, president.

Nash—C. W. Nash, president.

Bank Credits

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.

NEW YORK, Jan. 13—The new year began with sharp upturns on both the stock and bond markets. Practically the whole list of bonds moved upward, with especially noticeable improvement in the Liberty issues. There were indications that investors, as distinct from professional traders, were coming into the market. There was also a marked upturn in foreign exchange markets last week. Sterling advanced over 10c last week, and on Monday of this week it reached $3.73½, the highest since early in August of last year. This rate is 30½ cents above the minimum of last December, and 55½ cents over the low record made in February of last year. Exchange on most of the continental countries moved up sympathetically with the pound sterling.

While price recessions continue, with indications that retailers in some lines are taking their losses, there has been some resumption of industrial operations following wage adjustments, particularly in the textile field. Slackening of activity, on the other hand, continues in the steel industry, with the closing of mills more than offsetting the reopenings. For the month of December there was a net loss of 51 mills in operation. The U. S. Steel Corporation is still operating at a little more than 90 per cent of capacity, in spite of the fact that the Corporation's last monthly statement of unfilled orders indicated further curtailment in the industry.

Business failures are still on the increase, as evidenced by the December returns. The number of failures at 1,525 compares with 1,050 in November, and the liabilities involved in the December failures made a new high record at $58,871,545. This compares with $30,758,136 in November and $8,300,342 in December, 1919. For the full year 1920, the preliminary returns placed the total number of failures at 8,831, as against 6,451 in 1919. The liabilities involved were $287,772,471, and $113,291,237 for 1920 and 1919 respectively. A great increase in both the number of failures and in liabilities occurred in each of the last two quarters for 1920.

The money market continued unchanged last week with call money at 7 per cent. Large sums were returned to the banks daily as unlendable. A slight easing occurred on Monday of this week, however, and call money loaned at 6 per cent for the first time since Dec. 21. Time money continued at the same rates quoted for the two previous weeks.

REVERE DENIES CHARGES

INDIANAPOLIS, Jan. 11—The Revere Motor Co. of Logansport to-day entered a general denial in Federal court in answer to bankruptcy proceedings instituted against it two weeks ago by Chicago creditors. Judge Anderson set the case for trial Jan. 18.

MEN OF THE INDUSTRY

Major Victor W. Page has resigned as managing editor of *Everyday Engineering Magazine* and technical editor of the Norman W. Henley Publishing Co., and has moved his consulting engineering offices from 2 W. 45th Street to 309 Lafayette Street, New York. He is now president and chief engineer of the Victor Page Motors Corp., which has been formed to manufacture and market a new lightweight car, equipped with a four cylinder air-cooled engine of his design.

W. G. Jarman, general manager and secretary-treasurer of the Hamilton Motors Co., manufacturers of the Panhard motor truck, Grand Haven, Mich., has resigned, taking effect immediately. Jarman prior to the Panhard connection was sales manager of the Jackson Automobile Co., prior to that Canadian manager for Briscoe, and earlier was connected with Maxwell-Briscoe and Ford.

A. Schroeder, Cleveland, was elected president of the Ohio State Rubber Tire Co. of Port Clinton, near here, Jan. 5. The other officers chosen are J. F. Langenau, Cleveland, vice-president; Harmon Hankammer, Port Clinton, secretary. The following constitute the board of directors: A. Schroeder, J. F. Langenau, W. S. Lee, Bellevue; E. P. Reichert and S. E. Gernerm, Port Clinton.

Daniel G. Thorne, formerly district manager for the Diamond T Truck Co., has joined the Republic Truck Co. and will have charge of sales to national buyers, such as oil companies and other organizations doing business in all parts of the country. This announcement was made by A. J. Whipple, general sales manager, who is here for the automobile show.

Thomas H. Bingham has been appointed production manager of the Matthews Engineering Co., Sandusky, Ohio, which is prepared to go into larger manufacturing schedules with the completion of its new factory additions. Bingham for the past five years has been general superintendent of the Akron works of the International Harvester Co.

R. Jackson Jones, European representative of the Traffic Motor Truck Corp., has returned to this country after a trip through all the countries of Europe. He reports that traffic dealers are optimistic over the future. The widespread use of trucks during the war has educated the public to their value.

Ludwig T. Kuehl, of Racine, Wis., has been elected a director and vice-president of the Northeastern Rubber Co., New York, succeeding George G. Bryant of Milwaukee. Richard G. Bryant of Racine is president and treasurer. Charles E. Davies has been elected a director and secretary.

J. H. Desmond for the past three years, district manager for the Hart-Parr Co., over their Canadian territory with headquarters at Regina has been called in to the factory at Charles City and placed in charge of salesmen in the field.

Lynn Harvey has been appointed manager of the new export department of the India Tire & Rubber Co. He was formerly assistant export manager for the Miller Rubber Co., and had also been connected with the H. K. Porter Co.

Dorsey W. Hyde, Jr., has left the transportation engineering division of the Packard Motor Car Co. to become assistant manager of the Civic Development Department of the Chamber of Commerce of the United States.

Forest H. Akers has been appointed assistant general sales manager of the Republic Truck Corp. For the past seven years he has been connected with the Reo Motor Car Co., latterly as general sales manager.

F. W. Potts, for several years northwestern district manager of the Republic Rubber Co., with headquarters at Minneapolis, has resigned, effective Jan. 15. No announcement has been made of his future plans.

Barney Oldfield, famous race driver who is now in the tire business, is one of the most interested visitors at the New York show.

H. L. Van Wyck, advertising manager for the Mitchell company, has resigned.

Pollak Makes Changes in Staff Organization

CHICAGO, Jan. 10—At a recent meeting of the Board of Directors of the Pollak Steel Co., D. E. Sawyer was again elected general sales manager for the year of 1921 and is located, as in the past, at the New York office of the company. S. K. Morrow, formerly manager of operations, is now manager of sales for the three plants, with the offices at Cincinnati works. C. G. Talbott, formerly assistant manager of operations is now manager of rolled products for the Marion plant.

A. C. Weihl, for several years superintendent of the Cincinnati plant, is now general works manager in charge of operations and production of the Cincinnati, Chicago and Marion plants. V. W. Prather, formerly cost auditor for the Cincinnati plant, is now general cost auditor of the three plants. R. A. Mitchell takes the position vacated by Weihl. J. H. Deickman becomes manager of materials and inspection of the three plants. W. P. Woods becomes auditor and G. H. Tallaksen, superintendent of the Chicago plant.

Sorenson Promotion Now Believed Certain

DETROIT, Jan. 11—Though no official announcement has been made of the appointment of Charles Sorensen to succeed F. L. Klingensmith as executive vice-president and general manager of the Ford Motor Co., there is no doubt here of the certainty of the move. The appointment is expected to be made this week, together with other changes to fill important positions vacated either through resignations or promotions.

Edsel Ford to-day said there was no truth in the rumor that W. G. McAdoo or W. C. Durant were to join the Ford organization.

HAVANA OFFICERS CHOSEN

HAVANA, Jan. 10—Samuel T. Tolon has been re-elected president of the Havana Automobile Dealers' Association, according to information reaching New York. With Tolon were named Francisco Pla as vice-president, E. W. Miles as treasurer, M. T. Vallin, assistant treasurer; Enrique Hemel, secretary, and J. E. Diaz, assistant secretary. The directors are Jose G. Lopez, J. M. Martinez, Gabriel Miguez, Octavia Longa, Ramon Fernandez, and Alejandro Rodriguez.

INDUSTRIAL NOTES

L. H. Gilmer Co., manufacturers of belting and woven products whose main plant is located in Tacony, Pa., has disposed of their Allentown plant, moving the machinery and equipment to their factory at North Wales, Pa., which plant has been expanded for additional equipment.

Dodge Brothers this week will pay a bonus to employees amounting to about $2,000,000 on a basis of 10 to 15 per cent of the wages earned during the year. Both office and shop employees will share the bonus, the practice of distributing which originated last year.

Gehl Mfg. Co., West Bend, Wis., maker of gas engines and ensilage cutters, resumed production during the week after being partly closed down to facilitate extensive improvements. A new gray iron furnace has been installed.

Speedograph Corp., Newark, N. J., has purchased a two-acre tract and four concrete buildings at Morris Plains, N. J., and by Feb. 1 expect to be in production of 100 instruments a day.

Latex Tire & Rubber Co. Fond du Lac, Wis., has broken ground for a 2-story factory addition, 60 x 80 ft., which will cost about $45,000 equipped.

Badger Mfg. Corp., Milwaukee, has leased a factory building in anticipation of a greatly increased demand for its product in the near future.

Martin Tire Corp., this city, which has up to this time been specializing on passenger car tires is planning to get into production on truck tire sizes.

Advance Rubber Co. has moved into its new plant in Brooklyn and is looking forward to greatly increased production in the spring.

Western Felt Works has completed its new factory buildings in Chicago and is preparing to go into production at once.

Hyatt Roller Bearing Co. will remain closed until Feb. 1 or later, according to business developments.

Ladish Drop Forge Co., Milwaukee, expects to get back to normal production by Feb. 1.

Duplex Truck Surplus $249,276 for Year

DETROIT, Jan. 10—Duplex Truck Co. at Lansing, Mich., reports current assets totalling $1,137,851.86; current liabilities of $538,436.29, and surplus of $249,276.25 for the year ending Oct. 31. The management also has charged off $200,000 depreciation.

In a letter to stockholders, Pres. H. M. Lee said the credit stringency hit the truck business worse than any other due to the fact that it essentially is a credit business, practically 95 per cent of all truck sales being on a time basis. "With banks refusing to discount paper taken by dealers, sales stopped automatically," he said, "because few dealers were sufficiently financed to be able to carry the customer's paper."

Duplex earnings during the first of the year, Lee said, were very satisfactory and demonstrated the force of the company's costs and selling prices and indicated that with ten or twelve consecutive months of normal business, the company could show satisfactory earnings.

Calendar

SHOWS

Jan. 15-22—Philadelphia, Annual Automobile Show, Philadelphia Automobile Trade Ass'n.

Jan. 17-23—Milwaukee, Annual Automobile Show, Milwaukee Automotive Dealers' Ass'n.

Jan. 22-27—San Francisco, Second Annual Pacific Coast Automotive Equipment Exposition, Auditorium.

Jan. 22-29—Baltimore, Annual Automobile Show, Baltimore, Automobile Dealers' Ass'n, 5th Regiment Armory, J. C. O'Brien, Mgr.

Jan. 22-29—Cleveland, Annual Passenger Car Show, Cleveland Mfr's & Dealers' Ass'n, Wigmore Coliseum.

Jan. 22-29—Montreal, Annual Automobile Show, Montreal Automobile Trade Ass'n, Motordrome Bldg.

Jan. 29-Feb. 4 — Chicago, National Passenger Car Show, Coliseum, Auspices of N.A.C.C.

Jan. 31-Feb. 5—London, Ont., National Automobile Show of Western Canada, London Chamber of Commerce, Armouries, T. C. Kirby, Mgr.

Feb. 5-12—Minneapolis, Annual Automobile Show, Minneapolis Automobile Trade Ass'n.

Feb. 7-12—Columbus, National Tractor Show, Columbus Tractor & Implement Club, Ohio State Fair Grounds.

Feb. 12-19—Hartford, Conn., Annual Automobile Show, Hartford Automobile Dealers Ass'n, Armory, Arthur Fifoot, Mgr.

Feb. 12-19—Kansas City, Annual Automobile Show, Kansas City Motor Car Dealers' Ass'n.

Feb. 14-19—St. Louis, Annual Automobile Show, St. Louis Automobile M'f'rs & Dealers' Ass'n, Robt. E. Lee, Mgr.

Feb. 14-19—Winnipeg, Western Canada Automotive Equipment Show.

Feb. 18-28—San Bernardino, Cal., National Orange Show, Fred M. Renfro, Mgr.

Feb. 19-26—San Francisco, Fifth Annual Pacific Automobile Show, Exposition Auditorium, George Mahlgreen, Mgr.

Feb. 21-26—Louisville, Annual Automobile Show, Louisville Automobile Dealers Ass'n, First Regiment Armory, C. L. Alderson, Sec'y.

Feb. 21-26—Salt Lake City, Annual Automobile Show, Intermountain Automotive Trades Ass'n, W. D. Rishal, Mgr.

Feb. 26-Mar. 5—Buffalo, Annual Automobile Show, Buffalo Automobile Dealers Ass'n, 74th Regiment Armory, C. C. Proctor, Mgr.

Mar. 2-10—Des Moines, Annual Automobile Show, Coliseum, C. G. Van Vliet, Mgr.

Mar. 5-12—Brooklyn, Annual Automobile Show, Brooklyn Motor Vehicle Dealers' Ass'n, 23d Regiment Armory, George C. Lewis, chairman.

Mar. 5-12—Pittsburgh, Annual Automobile Show, Automotive Ass'n, Inc., Motor Square Garden, J. J. Bell, Mgr.

Mar. 7-12—Syracuse, N. Y., Annual Automobile Show, Syracuse Automobile Dealers Ass'n, Armory, Howard H. Smith, Mgr.

Mar. 7-12—Indianapolis, Annual Automobile Show, Indianapolis Automotive Trade Ass'n, Automobile Bldg., State Fair Grounds, John Orman, Mgr.

Mar. 12-19—Boston, Annual Automobile Show, Mechanics Bldg. and South Armory.

Mar. 14-19—Omaha, Annual Automobile Show, Omaha Automobile Trade Ass'n, Inc., Omaha Auditorium, C. G. Powell, Mgr.

April 4-9—Seattle, Annual Automobile Show, Seattle Motor Car Dealers' Ass'n, Arena Hippodrome.

April— Chattanooga, Tenn., Spring Automobile Show, Chattanooga Automotive Trade Ass'n, Sunday Tabernacle, C. A. Noone, sec'y.

FOREIGN SHOWS

Jan. 22-29 — Colombo, Ceylon Motor Show.

Feb. 7—Delhi, India, Delhi Motor Show.

Mar. 23-28—Witwatersrand Agricultural Show including machinery and motors sections.

CONVENTIONS

Feb. 2-4—Chicago, First Annual Meeting, Automotive Electric Service Assn. Hotel La Salle.

May 4-7 — Cleveland, National Foreign Trade Council.

Oct. 12-14, 1921—Chicago, Twenty-Eighth Annual, Convention National Implement & Vehicle Ass'n.

30 Organizations Back Uniform Vehicle Act

WASHINGTON, Jan. 12—Principles of a uniform vehicle act were adopted here to-day by the National Conference on Highway Traffic Regulations, and there was practically no variation from the proposed uniform vehicle law adopted last year by a committee representing the National Automobile Chamber of Commerce, American Automobile Association, American Association of State Highway Officials and the Highway Industries Association. The acceptance of these principles virtually means that instead of six national organizations, there will be more than 30 organizations pledged to support the underlying principles in an effort to have them placed on the statutes of all states.

At the suggestion of Harry Meixell, representing the National Automobile Chamber of Commerce, National Automobile Dealers Association, Motor & Accessory Manufacturers Association and Rubber Association of America, the conference did not specify any weight limitation.

On the objection of Meixell in behalf of the automotive organizations, the conference reconsidered its vote on mandatory stops at crossings and refused to include it in the declaration of principles.

Bureau of Mines Drops Gravity Specifications

WASHINGTON, Jan. 12—Specifications for petroleum products have been completed by the Bureau of Mines. The report, made public to-day, shows more definite standards of testing for automobile fuels and oils. Most of the suggestions of the Society of Automotive Engineers were incorporated.

The old gravity specifications for fuel oil have been completely eliminated. The viscosity requirement has been set for each grade of fuel oil and the Saybolt "Furol" viscosimeter adopted for testing all fuel oils was purchased by the Federal Government.

Lubricating oils specifications are practically unchanged, but several new grades have been added.

"Old Timers" to Hold Chicago Show Dinner

NEW YORK, Jan. 12—At a meeting of the Advertising Managers Council of the M. A. M. A., Ralph Leavenworth speaking for the Standard Parts Co., said that the Old Timers Club had enrolled more than 6,000 members. He said that the idea of this club was originated by Jim Braden, former advertising manager of that company, and no one had expected the distribution of badges to be taken so seriously. His plan was that this idea should become so widespread that it could be taken over by those he had enrolled.

Acting on this suggestion, several of those enrolled met yesterday at the Vanderbilt Hotel and formally decided to announce a dinner to take place during the Chicago show. All "Old Timers" will be welcomed at this dinner. At that time, Richard Kinnerdall, chairman of the nomination committee will announce the following nominations for office:—president, Albert Champion; secretary, F. Ed. Spooner; treasurer, Harvey Firestone.

Big British Companies Overcome Difficulties

LONDON, Jan. 10—No acute financial distress is anticipated for any of the important British automotive companies despite the general money tightness and vehicles awaiting sale. Creditors realize that a bigger loss would follow forced closures and they have confidence in the inherent stability of the trade.

Dunlop Rubber Co. has declared that negotiations concerning the company's American affairs may last another week. Its report for the financial year is expected this month. Stockholders have been cautioned by the company not to pay attention to adverse reports on Dunlop.

Briton Motor Co., Wolverhamton, one of the oldest British car manufacturers, has shown itself to be suffering from the financial stringency, but declared it to be only temporary. Orders are reported for $1,500,000 worth of cars on which deposits have been paid. Trade liabilities are given as $150,000 to Nov. 30, and bankers hold debenture securities for $200,000. It is proposed to liquidate the indebtedness by monthly installments beginning in March.

If this proposal fails the alternative will be a forced realization by the debenture holders.

VOL. XLIII INDEX

The index to Automotive Industries, Vol. XLIII, which comprises issues for the second six months of 1920, will shortly be off the press. It will be mailed without charge to subscribers who make a request for it.